

# AN ANALYSIS OF TEXTBOOK EMPHASES IN INDUSTRIAL ARTS EDUCATION

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## TABLE OF CONTENTS

	Page
LIST OF TABLES .....	vi
LIST OF FIGURES .....	viii
Chapter	
I. INTRODUCTION - THE PROBLEM DEFINED .....	1
The Problem .....	3
Procedure .....	4
Definition of Terms .....	5
Limitations of the Study .....	6
Other Studies .....	8
Implications of the Study .....	8
Sources of Data .....	9
Scope and Sequence of the Study.....	10
II. PHILOSOPHIC AND CURRICULAR BACKGROUNDS...	11
The Organic Theory of Education .....	14
The Learning Process .....	16
The Place of Industrial Arts in Education .....	22
Relationships of Industrial Arts and Industrial-Vocational Education .....	24
III. THE TEXTBOOK IN EDUCATION .....	32
History of the Textbook in America ....	34
The Function of the Textbook .....	42
Choosing a Textbook .....	46
Significant Trends in Textbooks .....	50
Significant Trends of the Industrial Arts Textbook .....	51
The Production of Textbooks .....	53
IV. CLASSIFICATION OF INDUSTRIAL ARTS TEXTBOOKS .....	58
Comparisons of Industrial Arts and Industrial-Vocational Textbooks .....	62
The Crafts or Avocational Textbook ....	64
Subject Areas .....	65

## TABLE OF CONTENTS - Continued

Chapter	Page
IV. <u>Continued.</u>	
Objectives of Industrial Arts .....	66
Criteria for Indicating Degree of Factor Emphasis .....	70
Definitions of Content Factors .....	72
Categories of Appropriate Use .....	76
The Inductive Process Used in Develop- ing Content Patterns .....	77
Recognition of Factor Content .....	78
Recording Data .....	79
Interpretation of Content Factor Patterns .....	82
Testing the Study Hypothesis .....	87
Textbook Selection .....	90
Selection of Supplementary Books .....	92
V. PRESENTATION AND INTERPRETATION OF DATA... 96	
General Data .....	97
General Analyses of Content Emphases ...	106
General Analyses of Approach Emphases ..	110
Comparisons of Authors' Classifications with Factor-Analysis Classifications..	116
Analyses of Textbooks Submitted by Individual Textbook Publishers .....	125
Problems of Textbook Authorship .....	134
Analyses of Textbook Emphases in Sub- ject Areas .....	139
General Shop .....	144
Woodworking .....	146
Mechanical Drawing .....	153
Metalwork .....	157
Handcrafts .....	167
Ceramics .....	174
Home Mechanics .....	176
Graphic Arts .....	178
Electricity .....	179
Photography .....	182
Automobile Mechanics .....	183
General Reference .....	186



# TABLE OF CONTENTS - Continued

Chapter	Page
VI. CONCLUSIONS AND RECOMMENDATIONS .....	190
APPENDIXES .....	196
A. ANNOTATED BIBLIOGRAPHY OF TEXTBOOKS SUR- VEYED .....	197
B. LETTER OF REQUEST FOR BOOK LOANS .....	254
BIBLIOGRAPHY .....	256

## LIST OF TABLES

Table	Page
1. Relationships of Content Factors to Objectives of Industrial Arts .....	71
2. Frequency Table of Authors Publishing More Than One Textbook .....	103
3. Multiple Publications by Authors of Textbooks Selected by Analysis for Industrial Arts Use .....	104
4. Multiple Publications by Authors of Books Written for Industrial Arts by Authors' Statements .....	105
5. Textbooks Authored by Two or More Authors ..	106
6. Frequencies of Authors' Statements of Intended Use .....	108
7. Textbook Emphases as Derived from Factor Analysis .....	115
8. Comparisons of Changes in Classification from Authors' Statements to Factor Findings by Subject Areas and by Classifications of Use .....	117
9. Percentages of Books Suitable for Industrial Arts Submitted by Each Publisher ...	126
10. Use Categories of Textbooks Published by Individual Publishers (Selected by Analysis of Content) .....	127
11. Use Categories of Textbooks Published by Individual Publishers (Authors' Statements of Use) .....	128
12. Table of Symbols and Factors Used for Content .....	141

# LIST OF TABLES - Continued

Table	Page
13. Percentages of Books Directed by Authors to Uses .....	142
14. Textbooks in Each Subject Area Found Suitable for Use in Industrial Arts by Factor Analysis.....	143
15. Summary: General Comprehensive Shop .....	145
16. Summary: Woodworking .....	148
17. Summary: Mechanical Drawing .....	154
18. Summary: General and Bench Metals .....	157
19. Summary: Machine Shop .....	162
20. Summary: Sheet Metal .....	163
21. Summary: Hot Metals .....	165
22. Summary: General Arts and Crafts .....	169
23. Summary: Plastics .....	170
24. Summary: Leathercraft .....	172
25. Summary: Art Metal .....	173
26. Summary: Ceramics .....	175
27. Summary: Home Mechanics .....	177
28. Summary: Graphic Arts .....	180
29. Summary: Electricity .....	181
30. Summary: Automobile Mechanics .....	184
31. Summary: General Reference .....	186

## LIST OF FIGURES

Figure	Page
1. Books Submitted for Study. Percentages of the Total Number of Books Submitted .....	99
2. Industrial Arts Subject Offerings. Percentages of Total Offerings .....	100
3. Comparison of Subject Offerings and Books Submitted .....	102
4. Factor Content of Textbooks by Analysis ...	109
5. Stability of Authors' Statements of Use When Compared to Factor Patterns .....	121
6. Stability of Authors' Statements of Use When Compared to Factor Patterns Not Including Non-Directed Books .....	121

## CHAPTER I

### INTRODUCTION - THE PROBLEM DEFINED

In this age of the specialist the industrial arts teacher must be a general practitioner. While teachers in other fields may specialize in one subject area, industrial arts teachers should be familiar with at least three subject areas of industrial arts to be certified. Although these subject areas are related, they often contain diverse elements, and some of them are further subdivided into related material or trade categories. A strong background in general education and in professional teaching methods is also expected of the industrial arts teacher. If he teaches "general shop" he must supervise simultaneously different projects and the use of different tools and materials. Add to this the problem of the individual pupil in a flexible laboratory situation, and the enormity of the task often seems overwhelming. It is only through effective organization and constant diligence that the industrial arts teacher may operate his program. Probably one of the best available sources of aid is the textbook; yet the proper and appropriate use of textbooks may be one of the most neglected phases of teacher-education. An inquiry among teachers will seldom reveal anyone who has made a study of the use of textbooks as a part of his undergraduate education.

The textbook is no less a tool for teaching than the hammer, each of which serves a specific function. Industrial arts teacher-education develops skill in the use of hand tools. Frequently, however, it would appear that the proper use of textbooks is assumed to be an inherited trait among teachers. William H. Cartwright makes the following comment concerning the textbook:

As a classroom tool the textbook serves three principal functions: to provide organization for the course, to supply a basic content, and to furnish common materials for learning. The organization is necessary and welcome to most teachers. To the alert teachers, however, it is not a limiting feature. Using the textbook only as a framework, he will expand portions or insert whole units in areas where he is particularly competent, where the local community can be utilized most effectively, where students express unusual interest, or where library materials are richest.<sup>1</sup>

To date, except for a few bibliographical compilations upon special subjects, industrial arts teaching personnel have not taken an inventory of the textbook tools available to the profession. In a recent statewide meeting of industrial arts teachers, two statements were made illustrating the state of confusion which exists concerning industrial arts textbooks. One statement was to the effect that an adequate supply of textbooks is available for industrial arts use. Later, an equally positive statement was

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<sup>1</sup>William H. Cartwright, How To Use a Textbook, How to Do It Series, Number 2, pp. 1-2, Washington: National Counsel for the Social Studies, 1947.

made that there are very few textbooks available suited to industrial arts instruction. Evidently, one, or even both, of the individuals was guessing or misinformed.

### The Problem

The illustration cited above pinpoints the central purposes of this study, which are to determine the status of the industrial arts textbook and its availability to the public schools. In order to determine the status of textbooks for industrial arts use a systematic approach must be made to the evaluation of status. Criteria must be established for the study to obtain an orderly and thorough analysis of textbook availability and to determine points of adequacy and failure. The study will be made with the following guiding purposes:

1. To determine adequacy of existing textbooks to meet the accepted emphases of industrial arts
2. To estimate adequacy of coverage of the subject areas taught under the classification of industrial arts
3. To discover which textbooks best meet the over-all objectives of industrial arts in each area of emphasis
4. To find the gaps or "vacuum pockets" which may exist in coverage of subject matter or in industrial arts emphases
5. To develop criteria for classifying industrial arts textbooks
6. To provide a suitable framework for appropriate industrial arts textbook content



7. To state a workable hypothesis of the relationship of industrial arts to industrial-vocational education for the purposes of this study

An assumption of the study is that publishers are able to select and recommend the industrial arts textbooks which they produce. Publishers were selected upon the basis of advertising in industrial arts periodicals and by cross checking bibliographies and references in textbooks and professional literature.

#### Procedure

In order to provide a clear statement of the conditions existing in the industrial arts textbook field the following steps must be completed:

1. To develop appropriate classification categories in the light of a clear statement of position regarding the relationship of the objectives of industrial arts to those of industrial-vocational education
2. To evolve definitive criteria for determining classification
3. To examine textbooks available for school use in the area of industrial arts to determine:
  - a. The emphases outlined by the aims of the author
  - b. Subject-matter materials presented in each textbook
4. To tabulate the data for analytical purposes
5. To provide an analysis of the tabulated data
6. To interpret the data and draw pertinent implications and conclusions.

### Definition of Terms

Industrial arts. A commonly accepted definition is one used by Wilber which defines industrial arts as "those phases of general education which deal with industry - its organization, materials, occupations, processes and products - and with the problems resulting from the industrial and technological nature of Society".<sup>1</sup> It is felt that Wilber's definition is satisfactory for the purposes of this study.

Industrial-vocational education as used in this study is synonymous with "specialized education" as defined by Good as follows: "Education that seeks to prepare individuals for specific types of occupations".<sup>2</sup>

Textbook as used in this study is defined as "any manual of instruction".<sup>3</sup>

Specialization is used to denote "education that seeks to prepare individuals for specific types of occupation"<sup>4</sup> and is used synonymously with industrial-vocational education.

<sup>1</sup>Gordon O. Wilber, Industrial Arts in General Education, p. 2, Scranton: International Textbook Company, 1948.

<sup>2</sup>Carter V. Good, Dictionary of Education, p. 216, New York: McGraw-Hill Book Company, Inc., 1945.

<sup>3</sup>Ibid. p. 423.

<sup>4</sup>Ibid. p. 383.

Orientation as used in this study refers to general education content or materials designed to be used in industrial arts courses aimed at developing attitudes, abilities, behavior, and appreciations considered desirable by society and to enable the individual to locate himself in relation to his technological environment. The term is used interchangeably with the general-education concept of industrial arts as defined above.

#### Limitations of the Study

This study is not intended as an exhaustive study of the industrial arts textbook. Format, readability, and construction of the textbook are not considered. Similar general details have been treated in previous textbook research. This study does not cover all textbooks used in the field because to do so would involve many more books than could be accurately appraised in one study. Only those books are covered which textbook publishers define as industrial arts textbooks and which are now in current supply during the academic year 1952-1953, in order to limit the study to the currently available books which may best meet the requirements for industrial arts.

This study is further limited because it is the first of its kind in the industrial arts field. There are no sources of comparative data. Inability to secure outside validation may open the data to some criticism, especially

when the data are subjective. The data used have been carefully scrutinized in an effort to maintain objectivity but it is subjective judgment and is subject to personal bias.

This is the first of a group of studies of textbooks which is to be made by the American Vocational Association in cooperation with other interested groups. Since this is a pilot study, one of its major tasks is to develop appropriate evaluative criteria and procedures. The development of these tools necessarily limits the scope of the study if reasonable bounds are to be maintained.

The number of subjects dealt with under the group title of industrial arts limits the size of the sample in some subject areas. Some areas contain as few as four books and the generalizations which may be drawn have limited validity, since one book may radically change the generalization. This is recognized as a limiting factor.

Generalizations concerning the total number of textbooks examined are also limited. The divergence of subjects and approaches to subject matter in individual books and groups are not comparable in many cases. Under these conditions generalizations for the entire group are seldom accurate or justifiable. Only generalizations which seem applicable are made for the entire sample.

While the philosophical and curricular concepts basic to this study are stated, no attempt is made to

develop them or trace their history.

### Other Studies

As far as can be determined, this is the first study of its kind in the field of industrial arts. It has been undertaken as the result of requests of representatives of both the Industrial Arts Section of the American Vocational Association, and the American Council on Industrial Arts Teacher Education, an affiliate of the American Industrial Arts Association. It is the first of three or more studies to be made concerning textbooks in industrial arts education.

### Implications of the Study

Initially, the major purpose was to evaluate the status of the textbook as a means of determining need and adequacy in the textbook field. As a result of findings made in the process of developing criteria other implications have developed. The method of content factoring seems to be applicable to use as a selective criterion in choosing textbooks for use in the classroom and as a screening device for state, municipal and individual selection. The device seems particularly well adapted for use by committees seeking objective data concerning textbook content applicable to industrial arts. The instrument is also useful in describing textbooks, as it describes the content

and basic approach of a textbook in one typewritten line. The system is not complicated and may be easily learned for selective purposes, making its use as a classification tool feasible. It is possible to select complementary textbooks that will insure good industrial arts coverage in almost any subject matter area with reference to emphases in the desired objectives of industrial arts. Further, the system discriminates between industrial arts and specialization or industrial-vocational textbooks.

To summarize the above statements: (1) The data have important implications for industrial arts personnel concerned with textbook selection and production. (2) The classification system seems to meet a need for selecting textbooks for complementary purposes which have heretofore been purely subjective. The classification system may prove to have more immediate application in the field than the data collected through its use in this study.

#### Sources of Data

Data used in this study are taken from: (1) the one hundred fifty-two textbooks submitted by publishers of industrial arts textbooks, (2) the United States Office of Education, The Biennial Survey of Education in the United States,<sup>1</sup> (3) various periodicals and publications

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<sup>1</sup>U. S. Office of Education, "Offerings and Enrollments in High School Subjects," The Biennial Survey of Education in the United States, Chapter 5, 1948-1950. Washington: Government Printing Office, 1951.



listed in the Bibliography, and (4) correspondence with publishers. The publishers were very cooperative in making their publications available for this study and in selecting the textbooks which they consider applicable to industrial arts.

#### Scope and Sequence of the Study

In this chapter the problem has been defined.

Chapter II states the philosophic and curricular principles used as guides in this study. Chapter III discusses the textbook in education in order to develop an understanding of the significance of the textbook and to provide background for some of the implications of the study. Chapter IV develops and illustrates the application of criteria for textbook classification. Chapter V presents and interprets the data of the study and provides conclusions drawn from the data. Chapter VI gives general conclusions and makes recommendations.



## CHAPTER II

### PHILOSOPHIC AND CURRICULAR BACKGROUND

Most writers of articles concerning textbook evaluation agree that philosophical and curricular implications govern the content and use of textbooks within all particular subject areas.

Ivan R. Waterman, Chief, Bureau of Textbooks and Publications, California State Department of Education, makes the following statement which seems to summarize the general opinion:

Evaluation implies standards. Textbooks should be chosen in terms of the particular purposes they are expected to serve. It would be difficult indeed to make intelligent choices of textbooks without a definite set of standards.... The aims of instruction should govern the choice of books. Otherwise the result in practice is likely to be confusion, or even worse, the nature of the particular book will determine the aims and nature of the instruction. This is putting the cart before the horse. Following is a list of points relating to the purposes to be served and values to be derived by starting the procedure of textbook evaluation with a valid set of standards.

1. Criteria for textbook selection are an expression of educational philosophy with respect to teaching the subject under consideration.
2. The course of study should serve as a guide in developing a statement of the purposes and nature of the textbook.
3. The use of a set of standards forces an analytical approach to the problem, and tends to assure that the final judgment of relative merit will be based on comparison of the textbook on each and every important standard.
4. The use of a set of standards tends to eliminate hasty judgment based upon superficial examination and general observation.

5. The use of a set of standards assures that books will not be selected because of their excellence in a few traits, although they may be deficient in others.

6. The use of a set of standards provides the same basis of judgment for all judges.

7. The use of a set of standards furnishes a basis for objective comparison in determining the relative merits of the textbook.<sup>1</sup>

Waterman also makes the following observation concerning the sources of the evaluative criteria: "The chief sources of criteria for textbook evaluation is the literature on curriculum and on methods of instruction".<sup>2</sup> He also states that specific standards must be established for each subject.

This study is not intended as an attempt to select textbooks for special purposes, but it does constitute an evaluation in terms of objectives. Objectives are the expressions of the purposes of the curriculum in terms of outcomes. The curriculum is an expression of philosophy; and method is the means to the end, - the guidance of activity leading to the realization of the objectives established by philosophy. All phases of the problem are concerned with philosophy and its implementation in the classroom or laboratory. Since philosophy is illusive and may not be observed directly, and since methods vary, the objectives or

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<sup>1</sup>Ivan R. Waterman, "When You Choose A Textbook", Phi Delta Kappan, XXXIII No. 5 (January, 1952) 256.

<sup>2</sup>Ibid. p. 256.

ends will be used in this study as the basis of evaluation of textbook emphases. This study is not intended for one particular situation; therefore, a synthesis of objectives from many sources will be used as the basis for standard criteria. No attempt is made to trace the development of philosophical abstractions, because it is felt that to do so would be like another sprint around a much-traveled race-track. The trip would exercise the runner; however, the average result would not be changed. It is generally assumed that the builder of a house need not manufacture the bricks to use them intelligently. If the builder properly applies the size and strength of the materials he uses, the building is sound. This study uses the materials produced by others and draws implications from the characteristics of the materials. If an understanding of the process of manufacture is desired, the manufacturers should be consulted rather than the user; therefore, documentation will not be used. The following sources provide the background for the implications stated:

American Vocational Association. A Statement of the Place and Function of Industrial Arts in Education. A report prepared by the Industrial Arts Policy and Planning Committee of the American Vocational Association. Washington: American Vocational Association, 1952.

Bode, Hoyd H. How We Learn. Boston: D. C. Heath and Company, 1933.

Dewey, John. Democracy and Education. New York: The Mac-

millan Company, 1916.

Dewey, John. How We Learn. Boston: D. C. Heath and Company, 1933.

Educational Policies Commission. Education for All American Youth, A Further Look. Washington: National Education Association, Rev. edition, 1952.

Kelley, Earl C. Education for What is Real. New York: Harper and Brothers Publishers, 1947.

Kelley, Earl C. The Workshop Way of Learning. New York: Harper and Brothers Publishers, 1951.

Keller, Franklin J. Principles of Vocational Education. Boston: D. C. Heath and Company, 1948.

Rugg, Harold. Foundations for American Education. Yonkers-On-Hudson, New York: World Book Company, 1947.

State Committee on Coordination and Development, William E. Warner et al. A Prospectus For Industrial Arts in Ohio. Columbus, Ohio: Ohio Education Association, 1934.

Wilber, Gordon O. Industrial Arts In General Education. Scranton, Pennsylvania: International Textbook Company, 1948.

Williams, Walter R., et al. Florida Presents a Guide to the New Technology in Industrial Arts. Bulletin No. 12, 2nd edition. Tallahassee, Florida: State Department of Education, 1948.

In order to orientate the reader to the philosophical and curricular assumptions made in this study, a series of general rather than specific industrial arts principles will be stated.

### The Organic Theory of Education

The organic theory of education is accepted as basic to this study. If all education is one organic entity, the parts (subject areas) take their cues from the purposes

of the whole. Thus, activities in the member parts have meaning only when related to the whole. The end of all education is the well integrated and organized individual; therefore, all units in education should contribute to this end. The specific implications for this study are:

1. Industrial arts must be justified not as a subject area but as a part of the educational whole. Industrial arts must be justified for inclusion in the curriculum by the nature of society and the needs of the individual for orientation to that society in order that he may become an intelligent participant.

2. There can be no disjunction between industrial arts and industrial-vocational education, since each takes its direction from the whole. This implies that the two divisions must be considered as a division of labor and not as warring elements. Under this philosophy all factors must be reconciled, since no other arrangement is compatible with the unity theory.

3. Textbooks and other materials must serve as tools to educate toward the end of all education and are differentiated only by a division of labor. The nature of the task to be performed establishes the content and approach of the textbook.

4. Education is the end - not subject matter. To consider subject matter as an end violates the organic concept



of education in that perception is based upon a closed system which finds its relationships internally and not with the whole of education. The experience or reconstruction theory of education is also violated if subject matter is considered as an end and internal reference is used for authority.

5. Orientation to a technological society is not achieved through a study of technology in a vacuum. Orientation to the American way of life is achieved through developing relationships between the individual and his entire environment and among objects and ideas in the American culture. Industrial arts as the instrument for achieving a particular phase of orientation must be related to work in other subject areas and particularly to general education content.

#### The Learning Process

The following implications from current educational theories and interpretations concerning the nature of the learning process are accepted for this study:

1. All learning takes place as the result of activity. Therefore the following may be assumed:
  - a. Textbooks should contain suggestions for activities, projects, experiments, field trips, collection of data, et cetera, as materials leading to learning.

b. General and technical information should be directly applicable to the activities, since information best becomes knowledge through application within concrete situations.

c. Activities should have many common applications, since transfer of learning is possible only through the existence of common elements in the different situations or problems. General and technical information should be integrated within the text rather than "added on".

d. The knowledge gained through activity should be the basis of abstractions. Generalizations should be drawn from concrete situations.

2. Reflective thought is a necessary part of the learning situation; therefore:

a. Projects and problems should be in the form of problems and not in the form of simple directions of "how to do".

b. Projects and problems should require the use of both familiar and new information if learning is to progress.

c. Projects and problems must lead into new fields of thought.

d. Projects and problems must require time and development. One thing must lead to another and pro-



vide for consecutively ordered activities.

e. Subject matter "set up to be learned" is of doubtful value, since thought is not required without applications.

f. Activity for the sake of activity is a poor learning situation because it calls for little or no reflective thinking.

g. Reflective thinking without motivation is impossible. The problems and projects must create interest if learning is to be most efficient. Interest should be related to process.

h. Text material should be organized as to encourage the development of creative thought - the applications of principles to new production and to new uses of materials and products.

3. The scientific attitude is necessary for learning. The "open mind" is necessary for the "reconstruction of experience" since the closed mind prevents change or reconstruction.

a. Books should present subject matter as the experience of the author, to be subject to revision in the light of new evidence.

b. No "one best way" should be presented to the exclusion of other ways.

c. Learning should not be forced. Imposition of

the will of the teacher upon the pupil often closes the mind of the learner.

d. Orderly procedures should be stressed but should not be used to constrict learning. Scientific method should be used as an aid to ordered thought and process and not as a standard pattern.

e. Evidence should be presented for alternate choices. Ready-made solutions relieve the learner of all responsibility for choice and do not lead to independent and creative thought.

f. Mistakes should be expected and should be utilized as directives to the evaluation of situations and as stimuli to inventiveness. Reevaluation and new trials are frequently valuable as learning situations and should serve as a spur to accomplishment. Mistakes may be a part of the procedure of scientific method.

4. The evidence that learning has taken place is the changed behavior pattern. "Reconstruction of experience" causes the learner to act differently.

a. Objectives should be stated in terms of expected behavior changes in order to facilitate observation.

b. Materials selected for the learning situation should be those that will change behavior in a desirable direction.

- c. All tests for learning should be based upon changed behavior.
- d. Evaluation of the learning process is a learning situation in which the student evaluates in terms of his original objective. Success and failure depends upon the achievement of student and teacher objectives as agreed upon and not by comparison to a set standard. The student should be able to justify all statements concerning his judgments by evidence.

5. Democratic procedures and processes should be used in the education of a democratic society.

- a. Respect for the individual must be maintained. Individual differences must be provided for through flexible programs and through the use of suitable flexible textbook materials.
- b. The teacher is a status leader by virtue of experience and superior knowledge and not by authority. Loyalty should be directed to truth and to principle. Textbooks should direct their approach toward creating respect for truth and principles as derived from sound evidence and should not take an authoritative approach to subject matter.
- c. Democratic procedures and processes should be practiced in all class activities.

- (1) Decisions concerning group activities may be best based upon group consensus if all students are to participate purposefully.
  - (2) Textbooks should provide for democratic group activities.
  - (3) Materials in textbooks should have group appeal if they are to be used by a group.
  - (4) Textbooks should focus upon democratic principles and processes.
- d. Democratic process in class work should be related to democratic process in real-life situations.
6. Interest or motivation is necessary for learning.
- a. Projects and problems must have intrinsic worth. The problem must be worth solving - must be something valuable to life.
  - b. Reflective thinking without motivation is impossible. The process as well as the product should be interesting in order to produce effective motives for learning.
  - c. Successful participation insures interest and future participation. Textbooks should present problems and projects suited to the age level and general ability of the students for whom they are written.
  - d. The learner should be a student of his own pro-

gress. Textbooks should provide means for evaluating student progress in terms that students understand.

e. Students should be allowed to plan their activities whenever practical. Textbooks should provide instruction in planning. Creativity should be encouraged.

#### The Place of Industrial Arts in Education

Industrial arts has been defined in Chapter I. In order for the reader to understand the criteria used and the implications drawn from the data, the part that industrial arts plays in education should be understood. The principles stated above establish the guides to the place of industrial arts in education.

Industrial arts should be provided for all persons and not for the few. If industrial arts is general education, and if general education is desirable in a democracy, it follows that industrial arts should be part of the education of all.

Industrial arts teachers should thoroughly understand both subject matter and teaching method. The teacher must be democratic, must understand the nature of the learning process, must be cognizant of socio-economic currents in American democracy and must understand the nature of the learner. The industrial arts teacher must be an educator,

a teacher of children. The subject matter of industrial arts should be secondary. This is not to imply that subject matter is not important, but to place first things first. The child in the learning situation is more important than the material or the activities of learning.

Industrial arts should take different forms at different levels. In primary grades and intermediate grades the program should be provided by the classroom teacher and should be largely enrichment and correlated activities.

In junior high school the program should be exploratory in nature and should be taught as a general shop course which provides experiences in several areas. The subject areas should present samples of industrial processes and should be related to guidance, consumer values, interpretation of technological implications in the American culture, development of vocational interests, general personal development, and to other subject areas. Manipulative activities should require general and technical information for their performance, projects should be presented as problems to be solved, and evaluations should be made by both students and teachers as cooperative activities. Democratic processes should be used throughout. This program should be in the hands of the industrial arts rather than the classroom teacher.

At the senior high level industrial arts should



have the characteristics of junior high school industrial arts except that it may be taught as a unit shop specializing in one subject area. Orientation is the purpose of the activities provided, but the work should be semi-specialized in order to provide for the development of conceptions of the more advanced processes used in solving technological problems in industry. Students should be concerned with tryout experiences for vocational choice or for further orientation in choices previously made as a result of junior high school experiences.

At levels above high school, industrial arts may be concerned with teacher education, with leisure time or avocational activities, and with orientational activities for those who have not been provided these experiences at other educational levels.

#### Relationships of Industrial Arts and Industrial-Vocational Education

The relationship between industrial arts and industrial-vocational education presents a particular problem for this study because of the overlapping nature of the two in subject matter areas and the consequent confusion that exists in textbooks and among professional personnel. The discussion below is based upon the principles stated previously.

Industrial arts and industrial-vocational education



are related to each other and to the whole of education. Coordination of purpose should be determined in the light of the total purpose of all education - to achieve the developmental ends of the individual in an organized society. Since the two are concerned in some way with this end, the only efficient way to operate is by a division of labor. Efficient division of labor implies definition of function. This definition should relate to the natural function of each and should not be arbitrary or artificial.

Comparison and contrast may be used to show the natural bases of division of the two areas. Industrial arts has become associated with general education. This can be illustrated through an examination of any recent professional textbook on the subject. As general education, industrial arts seeks to orientate youth to industrial or technological society. This exploration is achieved through a two-stage process. The "overview" is the function of junior high school work and is associated with the general comprehensive shop. The testing of special interest and exploration in semi-specialized work is usually given at the senior high level in the unit shop or the general unit shop. If industrial arts coursework were confined to junior high schools, there would be little confusion between the functions of the areas. The confusion is a development growing out of the close similarities of industrial arts and industrial-vocational educa-

tion at senior high school levels. The technical high school generally is organized for grades ten through twelve. Industrial arts at this level is usually elective and is concerned with semi-specialized exploration for the development of concepts of more advanced techniques used in industry. Industrial-vocational education at this level is also concerned with exploration to discover particular aptitudes, to develop general skills, and to provide tryout for guidance purposes. To the uninitiated, the two branches apparently treat the same materials for the same purposes. It should be noted that the "pale carbon copy" idea of industrial arts is a natural product of this situation. At this point it is frequently assumed that industrial arts is a "junior vocational program" and should assume the role of feeder to the industrial-vocational program. If industrial-vocational education is to build from the foundation established by industrial arts, it is only one step further to the assumption that industrial arts should be controlled by industrial-vocational personnel. The fallacy in this reasoning is that all factors have not been considered. The evidence is selected and weighted in order to reach a premeditated conclusion. All contrary evidence is avoided.

The evidence which has not been considered in making this apparently logical conclusion may be summarized as

follows: First, industrial arts is taken by approximately one student in four in all high schools.<sup>1</sup> Less than one out of ten students are enrolled in industrial-vocational education.<sup>2</sup> This means that approximately seven out of twenty students now taking industrial arts might be expected to continue in industrial-vocational education, or seven out of each one hundred enrolled in all subjects in grades nine through twelve. If related subjects are not counted as industrial-vocational education, the ratio is materially decreased, being approximately one for each five students taking industrial arts, or less than five in each one hundred students enrolled in the last four years of high school. To give supervisory functions to industrial-vocational education personnel is analogous to the tail wagging the dog.

The second basic factor that has been neglected is the matter of degree of emphasis. It is assumed that each area places equal emphasis upon each of the functions commonly served. This is not the case, however. Industrial arts treats exploration and orientation as an end. Industrial-vocational education uses orientational materials, but the emphasis is upon the orientation of the "worker to industry" and the amount of orientation to technological

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<sup>1</sup>U. S. Office of Education, op. cit. p. 18.

<sup>2</sup>U. S. Office of Education, op. cit. p. 19.

society is negligible. The efficient worker is primary; orientation to live in a technical society is secondary. Time allotted to industrial arts is usually five periods per week. It is inconceivable that a skilled worker could be produced in the time spent in class activities. In industrial-vocational education the practice is to allot at least fifteen periods a week to the development of skills in a trade.

Materials selected are a third neglected factor. Specialization materials are selected to produce saleable skills. To be saleable the skills must be those immediately usable in industry. Transfer of thinking is of little concern. The central purpose is to produce a worker who thinks well in one particular area and who knows the tricks of the trade. Industrial arts materials should be applicable to many situations and should be taught for the purpose of giving general experiences at the senior high school level. A fourth situation, which has not been taken into account by showing the like and unlike factors, is that industrial arts programs and industrial-vocational education programs are seldom provided in one school. This particular situation produces a vacuum into which the existent program is drawn. Industrial arts programs attempt to perform some of the functions of the industrial-vocational program in the name of needs. Industrial-vocational programs provide

more orientational emphases because of the need. In view of the fact that the two exist together in only a few large city situations, overlapping is a general condition and the consequent confusion is multiplied. To operate efficiently and without confused outlook both programs must operate simultaneously and within bounds. Industrial arts should provide orientation for all youth. Industrial arts should utilize the senior high school program as a tryout program for guidance and for development of industrial concepts. This program should be an elective through guidance and should enable the student to evaluate his potential interest and ability in a trade. Evaluation of this experience should help the student in deciding upon a future vocation. When vocational choice has been made, the student should have the opportunity of electing a vocational program in which he may develop saleable entry skills for his chosen industrial field. In this way the industrial arts program may serve as a feeder program for industrial-vocational education; not as an agency to be controlled by the program being fed, but as a referral agency. The matter of control of industrial arts by industrial-vocational education is a debated problem. Control can be effected only through the body of education as it seeks to integrate and coordinate all effort for the good of the individual student. If both divisions dealing with industrial education become



aware of their true function in the organic concept of education, there is no real difference that cannot be satisfactorily resolved. There is no justification for a divisive theory of education except for purposes of guaranteeing proportional emphasis. There are no disjunctive alternatives between industrial arts and trade education. The disjunctive alternative is only an appartition or a lack of insight into education as a unified whole. It is the result of seeing the part as an entity rather than as a portion of the pattern in the "field". It is only as industrial arts or trade education is seen against the total field of education as life, taking its cues from the nature of the organism learning and living in socially organized units that either may be perceived in its relationship to other members making up the pattern or to the field as a whole. Divisive elements are often the result of ideational nearsightedness upon the part of many specialists. If education is to become what it should be, every member of the teaching profession must be fitted with bifocal vision. Perspective cannot be gained by seeing only the near element. "Perception sets reality." Until all parts of the picture are related, perception does not approach reality. The elements must be seen from several viewpoints.

When, and if, the comprehensive high school becomes common, the two areas can be expected to find definition upon orientation and specialization. If both programs are



included in every school, division of labor and efficiency will be achieved by allotting all orientation to industrial arts and allotting all special trade education to industrial-vocational education. This basis is used to establish the criteria in this study for differentiating between industrial arts and industrial-vocational materials.

This chapter has sought to give a background of underlying implications for understanding the derivation of categories and criteria and for interpretation of the results of the data compiled. The assumptions made are only those basic to this study and are not to be considered as a complete statement of philosophy or a complete curricular interpretation.

### CHAPTER III

#### THE TEXTBOOK IN EDUCATION

Professional literature has been both friendly and hostile to the textbook. According to some writers it might be assumed that the textbook as a useful tool in education is on the way out. "Dry as dust" textbooks, the "lockstep of the textbook" and other such phrases are often evidence of attempts to place the blame for poor teaching and learning. The textbook is said to "restrict the teacher and confine the pupil, to formalize the organization and stultify the procedure, to narrow the viewpoint and deaden the interest, to instill an awe of the printed word, and to freeze the content of the curriculum".<sup>1</sup>

Cartwright identifies the textbook critics as follows:

Textbook critics are of three principal classes; Those who ignore the advances which have been made during the past generation in selecting, grading, and in organizing textbook content; ultra-progressives, who do not believe in a fixed curriculum because they think there are no facts or ideas of enduring value; and those who seem to believe that the typical overburdened American teacher can, in a comparatively short time, dash off a course of study and round up materials which will provide a better basis for instruction than a textbook does.<sup>2</sup>

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<sup>1</sup>William H. Cartwright, How to Use a Textbook, How to Do It Series, Number 2, p. 5, Washington: National Council for the Social Studies, 1947.

<sup>2</sup>Ibid. p. 6

Many statements have been written in answer to the critics of the textbook. Several quotations will give the gist of the defense.

Hollis Caswell states, "From the long view, textbooks have played and most likely will continue to play a highly important role in instruction."<sup>1</sup>

In a slightly different vein, Donald Durrel, Professor of Education, Boston University, remarks "Textbooks may become the basis for blind regimentation, but even then the teacher stupid enough to let this happen would probably do worse without textbooks".<sup>2</sup>

E. R. Jobe, Executive Secretary of the Mississippi State Board of Trustees of Higher Institutions of Learning, makes the following observation:

The place of the textbook in the American public is as secure today as it was in the days when promotion of students was from book to book, and when the quality of a recitation was judged upon how closely it followed the words of the text.... The time honored tool of the teacher, though used differently today, is still a prime factor in the efficiency of the public schools in educating the masses of the people. Because of the organization and completeness of subject matter provided in the text, the time provided for the recitation may be used in critical analysis, in application of principles, in discussion, in independent thinking, in whatever way that the teacher may plan since he is relieved of the necessity of imparting the basic in-

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<sup>1</sup>"What are Textbooks For?", A Symposium, Phi Delta Kappan, Vol. XXXIII No. 5, (January, 1952), 242.

<sup>2</sup>Ibid., p. 243.

formation.<sup>1</sup>

The quotations cited are only a few which illustrate a cross section of viewpoint. The citations are not proof but serve to show the types of evidence available.

### History of The Textbook in America

The history of the textbook is very closely connected with the history of education and the history of developing America. Developments in education, in politics, in economics and other aspects of the American scene form the backdrop for the story of the evolution of the textbook. It is only in this perspective that the story is meaningful.

In the early history of our country the people were deeply religious. This fervor was reflected in "ye old deluder Satan act" of 1647, and in the textbooks used in the schools of that time. The books were imported from England. Loveland makes the following statement concerning the types of books used:

In spite of drawbacks, however, a few books were imported for the classroom. A pupil in an early colonial school usually had a catechism or primer, a psalter, and a Bible from which to get his elementary education. If he went on into grammar school he might have a few Latin and Greek books, and, rarely, arithmetic and geography textbooks.

Just as colonial housewives had a few imported dishes, pots and pans, and "made do" with home-made wooden dishes, gourds and rough clay pottery utensils, so teachers "made do" with homemade substitutes for

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<sup>1</sup>Ibid., p. 243.

textbooks. The most famous of these makeshifts was the horn book, which as Clifton Johnson points out in Old Time Schools and School Books (Macmillan, 1904), "was really not a book at all, but simply a bit of printed paper about three by four inches, fastened on on a piece of thin board. The name 'horn book' originated in the fact that the printed slip was covered with a translucent sheet of horn, 'to save from fingers wet the letters fair'. A light strip of metal, usually brass, was fastened with several short nails or tacks around the edges of the horn to keep it in place.... At the top of the paper was printed the alphabet, capitals and small letters; and then in orderly array the vowels, then double lines of ab --eb --ib (et cetera) and the benediction.... The remaining space was devoted to the Lord's Prayer, unless, as was sometimes the case, this was supplemented at the bottom by Roman numerals".<sup>1</sup>

The earliest imported textbooks were called "primers" and were used as aids for teaching reading and to give religious instruction. The contents were devotional materials taken from the Bible, the alphabet, syllable sounds, and other similar aids to reading.

Early spelling books were more than the title implied. They contained arithmetic, history, writing lessons, prayers, psalms, and a short catechism. The English Schoolmaster, published in 1596, is the earliest recorded importation.<sup>2</sup> One of the most popular imported textbooks was Dileworth's A New Guide To The English Tongue. Benjamin Franklin issued an American edition in 1747. This book was a departure from the textbook of the day in that it was made

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<sup>1</sup>The American Textbook Publishers Institute, Textbooks in Education p. 18. Gilbert Loveland, editor, New York: The American Textbook Publishers Institute, 1949.

<sup>2</sup>Ibid., p. 23.



up of fables and stories of a secular nature.

Arithmetic was usually taught in colonial schools without the use of a textbook. The pupils made "sum books" in which they copied problems, definitions and rules.

Most of the early American Textbooks were improvisations or adaptations of those originally published in England. One of the most widely used exceptions to this rule was Cheever's A Short Introduction to the Latin Tongue issued in 1645. This textbook was used in New England for almost a hundred years. The New England Primer was issued some time before the turn of the eighteenth century and was a phenomenal success, selling over two million copies in its various versions over the century of its use.

It is interesting to note that the sale and distribution of textbooks before the Revolution was carried on by the New England or "yankee" peddler.

At the time of the Revolution pupils were using far more imported books than those which were printed in America. The American Revolution served to cut the tie with England and to put an end to importation of textbooks. Loveland makes the following comment:

The immediate problem for American schools was the supply of textbooks.... American textbook makers were on their own: They either had to produce schoolbooks or go without. "The emergency produces the man". And that man was Noah Webster, maker of textbooks, compiler of the dictionary.... During the years 1761 and 1782 while he was teaching first at Sharon, Connecticut,



then at Goshen, New York, Webster prepared the manuscript of a spelling book.... His book was revolutionary in that he proposed spellings and pronunciations that were based upon American instead of British usage. In a small way it was a Declaration of Independence for the American language. He took it to his old schoolmaster, the president of Yale, to ask his comments and advice. We don't know what effect Yale's president had on the contents of the book, but we do know that he pinned a title on it that would have sunk a lesser book! He persuaded Webster to name it The First Part of a Grammatical Institute of the English Language. The other parts were to be a grammar and a reader, which Webster issued sometime later.<sup>1</sup>

Webster made a one-man crusade to get states to pass copyright laws. After a copyright law had been passed in his own state, he entered into a contract for printing the book. He was forced to publish the book at his own risk, so he became author, publisher, and later, salesman for his book. The book was revised and renamed The American Spelling Book in 1817. In 1829 the book was again revised and named The Elementary Spelling Book which is famous as the "Old Blue Speller." The book became the best seller next to the Bible. It is interesting to note that in 1946, the American Book Company printed five thousand copies of this speller.<sup>2</sup> Many imitations followed the original "Blue Speller." Spelling became an educational fad as well as a social pastime. The country became flooded with spelling and arithmetic books.

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<sup>1</sup>Ibid., pp. 32-33.

<sup>2</sup>Ibid., p. 34.

Noah Webster achieved great prominence in the textbook publishing industry because of the impetus he provided. He not only was a successful publisher but was largely instrumental in getting copyright laws passed. He broke the ground in the textbook publishing field.

Publishing was a hit or miss business. There was little relationship between publishing a text and the need for the text. Any printer was a potential textbook publisher and any teacher was a potential textbook author. The sales were still in the hands of the peddler. General disorganization was the best description of the textbook publishing industry at this stage. This condition prevailed until the modern textbook publisher came into the picture. It is pertinent at this point to define the function of the textbook publisher. Loveland's report defines these in terms of what the publisher is expected to do, as follows:

1. Determine need
2. Analyze market
3. Weigh competition
4. Select authors and manuscripts
5. Plan with author to meet need, market, and competition
6. Edit (rewrite, check accuracy, tailor manuscript to predetermined needs and usefulness)
7. Determine mechanical details (size, type, paper, binding, etc.)
8. Distribute (sell)<sup>1</sup>

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<sup>1</sup>Ibid., p. 41.

These definitive functions were not developed in an organized manner but were the result of trial and error over a period of time. One of the best examples from the developmental history of the publisher-initiated-textbook is that of the McGuffey Readers and the Truman-Smith publishing partnership. The publishers discovered that a need existed for a graded series of readers. It was decided that the readers should contain secular rather than religious literature. This was a particularly wise decision because of the circumstances at that time. The West had begun to boom and Cincinnati, where Truman and Smith had gone into business, was the trading center of a wide area far removed from the church school of New England. The times (1830's) were prosperous and selling was easy. The secular approach appealed to the people of the new non-sectarian West.

William McGuffey was selected by the publishers to write the readers. McGuffey was one of the outstanding educators of the middle west and brought a large store of experience as teacher to the task of compiling the readers. For the seven readers he received one thousand dollars each, but he was paid again for each revision that he made. Needless to relate, the readers were a much greater success than had been anticipated. It has been estimated that over 122,000,000 copies were sold before 1920. In 1947, 70,000

copies were printed.<sup>1</sup>

Loveland after summing up the first one-hundred fifty years of the story of the American Textbook makes the following transitional statement:

The early history of manufacturing and trade had as its center such items as the cotton gin, the power-spinning jenny, the telegraph, the steamboat, and the reaper; but in the years just before and just after the Civil War the emphasis shifted to management, bringing together the conception and creation of the product, the development and improvement of its processes of manufacture, the study and development of markets in which to sell it.<sup>2</sup>

As the rewards for successful textbooks increased, the professional textbook writer became more common. Some were subject specialists, but others were specialists in textbook writing and wrote in any area. Peter Parley, whose real name was Samuel Goodrich, is an example of the last type of textbook writer. He appeared on the scene in 1843<sup>3</sup>, and covered the entire field, producing eighty-four textbooks.

In the early days of the modern period of textbook publishing the publisher gradually assumed his modern role. The publisher became judge and critic of the authors' work,

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<sup>1</sup>Ibid., p. 45.

<sup>2</sup>Ibid., p. 46.

<sup>3</sup>Ibid., p. 47.

he surveyed the field for prospective authors, selecting the most promising, and he collaborated in the production of the book.

The development of professional education for teachers also had its effect upon the rise of the textbook publisher. The professionally prepared teacher became the textbook writer and the purchaser of materials prepared by the publisher, and in both capacities, did much to stimulate the textbook publishing industry.

A history of printing in America would be pertinent to the development of the textbook industry, but would add little to an understanding of the problems of this study. The history of printing is much the same as other industrial developments and is concerned with the mechanization of the industry and with the refining of techniques.

The distribution of textbooks passed through a turbulent period in which the publishers struggled against the evils of cut-throat competition and the increasing demands of the users of books for discounts and rebates. While competition is still keen, this competition has produced the modern textbook. The service provided to education by the textbook publishers cannot be estimated. It is even possible that without this service, education in this country would not have developed for the masses but would have patterned itself after some of the European systems.



At present the sales of textbooks are handled in various ways in different localities due to different methods of textbook purchases and the varied methods of state and municipal adoption. Sales are confined to certain months of the year, usually the months between the school years, and quantities are not foreseeable because of the likelihood that a large system may change adoptions or that replacements may not be needed for several years after adoption.

#### The Function of the Textbook

The textbook has been compared to a tool. The skill with which a tool is used determines the quality of the product. The way the textbook is used determines to a large extent the quality of the educational product of the school. It is not a simple tool to use efficiently. Methods teachers in teacher education institutions frequently spend their time with other matters, or emphasize methods of teaching without the use of textbooks. The fact that many teachers blame the textbook for personal ignorance should cause little surprise. The novice is seldom able to use an unfamiliar tool and perform a creditable job. The teacher should be as skilled in the use of textbooks as a carpenter is in the use of a rule. Most of the literature on textbooks is concerned with criticism of textbooks, defense of textbooks, and with evaluation of textbooks. There are, however, a few articles and reports dealing with their use.



### The Purpose of the Textbook

Caswell gives the following purposes of the textbook:

Textbooks should serve as an aid to teaching. They should provide the common body of source material most needed by pupils studying specified fields of problems. They should be organized in a form that facilitates their use by teachers with various levels of skill - those who are incapable of planning the broad outlines of a program and those who do not have competent curriculum leadership available to help them to do so, and those who are able to sense the needs of a particular group of children so fully, and who know the fields upon which they draw so well, that they can tailor make the program for each class, giving them what they most need.<sup>1</sup>

Paul R. Hanna, Professor of Education at Stanford cites two main purposes of textbooks:

(1) It is an organized presentation of some core of knowledge; and (2) It is an instrument by which the reader is helped to observe his own experiences in the world about him and from such observation to organize his own system of ideas and to shape his own attitudes about the subject at hand.... Modern psychology has finally convinced most educators that, unless a textbook simultaneously carries both purposes forward, for the great majority of learners at least, little desired change in behavior will result from the use of the textbook.<sup>2</sup>

### The Use of the Textbook

The textbook must be used intelligently if it is to serve the purposes for which it is intended. The textbook

<sup>1</sup>"What Are Textbooks For?" op. cit., p. 243.

<sup>2</sup>Ibid., p. 298-299.

should not be followed slavishly; neither should it be discarded. The textbook is an aid to learning, a support for the course of study. Criticisms aimed at textbooks have come largely as a result of the overuse of the textbook. The course of study is an organized plan for coordinating all of the learning activities which go into the learning processes. Other activities may include field trips, motion pictures, recordings, surveys, demonstrations, projects, dramatizations and other aids to learning. The textbook is one of the more important sources of information, yet it is not a substitute for other activities, and in no case is it a substitute for the course of study.

The teacher's responsibility in textbook use does not end with delivery of the textbook to the pupil. The teacher should be thoroughly familiar with the content. He should know something about the publishers and the author, how the book is intended to be used, what the materials of the book are, how it is written, the teaching aids which are provided, and whether or not the book is one of a series. If the book is a series edition, something should be known about the other books in the series. The reading level of the text should be known. Reading and concept difficulties are frequently the keys to poor learning. Appropriate word level will not compensate for concepts which are foreign to the children using the book.

The teacher should do more than know the nature of the textbook; he should take time to make the child aware of the needs met by the book and of the study aids provided. Special attention should be given to appropriate ways for studying the book, and to the use of review and testing aids when they are provided. The child should also be taught to interpret and use materials in graphic forms. Much of the information provided in books is often presented through these aids.

#### Limitations of Textbooks

The intelligent teacher does not use the textbook as a substitute for teaching or for organized classwork. Textbooks are most often written for use on a national scale and may not meet some of the local needs. Teachers should be alert to these needs and should make provisions for them by supplementing the text with other written materials, with field trips, and with visual aids. Textbooks often contain sections that are not particularly suited for use in the class which the teacher has planned. The teacher should omit these sections or provide supplements from other sources. Books often are not up-to-date in content and must be supplemented with more recent materials from periodicals or more recent books. The teacher must also be alert to the differences in children's reading and comprehension abilities and should provide other books appropriate to the

educational level of the child.

### Choosing a Textbook

The literature on the textbook is rich with materials telling how to choose a textbook for use and for adoption by schools. These suggestions range from the ridiculous to well developed methods. In choosing a book, the method is comparable to the method of choosing any other consumer item. The final choice depends largely upon personal needs and comparative qualities. The American Textbook Publishers Institute gives the following suggestions:

1. Look for books whose teaching aims are in harmony with your own.
2. Be sure the book does well what it claims to do.
3. If a compromise must be made, select the book that does the job that it claims to do.
4. Try the book on yourself. "Take the course" or at least enough of it to see how it works.
  - a. How good is the author's teaching program?
  - b. How well does he visualize the classroom scene?
  - c. Does he visualize what children can and like to do?
  - d. Does each step in the book drive toward the goals you would like to achieve?
  - e. Does the author give materials appropriate to the learners that will be in your class?
    - (1) Will the child understand the language used?
    - (2) Has he anticipated the children's reactions?

- f. Does the author make the materials personal for the child? Does he "talk down" or over simplify?
  - g. What about the use of visual aids -- pictures, cartoons, diagrams, maps, graphs, charts? Do they really teach? Are they just added on?
  - h. Does he provide for frequent breathing spells? For discussions? Does he make suggestions that take the class completely out of the book? Are suggestions made for outside readings? For dramatizations? For research? Are the activities practical for the class and for you?
  - i. Does the author provide for individual differences?
5. Try out the book on your class in the way that the author intended it to be used. This will give you the final proof for selection. To give it a fair trial you should:
- a. Read the directions for use.
  - b. Follow the directions carefully.<sup>1</sup>

Ivan R. Waterman in an article entitled "When Your Choose A Textbook" gives the following four steps in choosing a textbook:

1. Formulate a set of criteria or standards by which the textbook under consideration may be judged.
2. Construct a score card assigning numerical values to the several items of the criteria in accordance with their relative values.
3. Conduct comparative studies, objective in nature so far as possible, to determine the relative merits of the several books on each item of the criteria.

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<sup>1</sup>  
The American Textbooks Publishers Institute,  
op. cit., pp. 85-92.

#### 4. Rate the books.<sup>1</sup>

The advantages of using a set of standards are given in Chapter II. It should be pointed out that it is necessary to develop standards in each subject area because general standards often do not apply fully to special subjects.

The following six points for judging textbooks appeared in an article prepared by The American Textbook Publishers Institute.

1. Date of copyright -- Books reflect the climate of opinion at the time they were written.
2. Fair criticism -- Material should be considered in terms of subject matter and author's intent.
3. Context -- Materials should not be criticized out of context. Materials should be considered as a whole.
4. Effect on the pupil -- Materials should be considered in terms of producing insight and understanding in the student.
5. Intended use -- Materials should be considered in terms of its use for authoritative or evaluative purposes in the school.
6. Bias -- Materials should be considered in terms of the bias of the whole book.<sup>2</sup>

<sup>1</sup>Ivan R. Waterman, "When You Choose a Textbook," Phi Delta Kappan, Vol. XXXIII No. 5 (January, 1952), 267.

<sup>2</sup>American Textbook Publishers Institute, "Six Tests of Textbooks". American School Board Journal, Vol. 122, No. 6. (June, 1951), p. 25.



### Choosing Supplementary Textbooks

Cartwright makes the following comments concerning the choice and use of complementary textbooks.

Most teachers use a single book as a text, but some prefer to use several textbooks, believing that in this way the student is exposed to different viewpoints and emphases. There is some question as to whether more is not lost than gained by the latter practice. The similarities among textbooks are more important than the differences. This is necessarily so because competing books are intended to serve the same purposes for the same readers. It is little wonder that the student who is required to reread the same account several times, whether in one textbook or many, soon learns to hate subject matter.... Another argument against the "multiple-textbook method" is that, to a considerable extent, it defeats the organization purpose of the textbook.<sup>1</sup>

Supplementary texts should be chosen in the light of need and not to secure a large variety of materials. Textbooks for supplementing should:

1. Contain emphases not included in the textbook chosen
2. Meet different reading and concept levels
3. Contain reference materials not available in other books
4. Contain materials for "updating" the textbook used
5. Contain different methods for comparative purposes
6. Meet individual needs of superior and subnormal children.

In summary, the primary value of the complementary textbook is to give a complete treatment of subject matter and to aid

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<sup>1</sup>Cartwright, op. cit., p. 6.

in achieving all pertinent objectives of the courses. It should be considered as additional material to be organized in the "course of study" outline and not as a second course of study or a duplicate textbook. Supplementary textbooks should be used in the same way that the reference library is used and not as core materials.

### Significant Trends in Textbooks

Elaine Exton has listed the following trends adapted from a statement by Lloyd W. King, Executive Secretary of The American Textbook Publishers Institute:

1. The style of writing is improved
2. Design and format is improved
3. Use of color is included
4. Books are built upon research
5. Books are related to child interest
6. Books contain more materials
7. Texts have been developed for special levels of ability
8. Books are designed with enrichment materials and self instructional aids
9. Stress is upon world affairs and national understanding
10. Stress is upon democracy, individual worth, and dignity
11. Distinctions are made between enrichment materials and basic texts
12. Textbooks reflect the thinking of modern educators

13. Adult education textbooks are beginning to be produced.<sup>1</sup>

### Significant Trends of the Industrial Arts Textbook

Little has been written concerning the textbook for industrial arts. Most authors have been concerned with projects, procedures, organization charts, job analysis, shop and tool room management, shop safety, the personnel system, and other techniques and practices. Probably one of the reasons for emphasis upon techniques and practices has been the dearth of textbook materials suitable for industrial arts. Wilber, in discussing the organization of subject matter for a study of industry in industrial arts, makes the following statement:

The average teacher may hesitate to initiate such a study because there is little precedent on which to rely. This is an area, however, where every teacher may help to blaze the trail toward a more defensible program of industrial arts. Sooner or later a body of experience will be developed which can be incorporated into suitable texts and workbooks; and these, in turn, will make the path easier for the teachers who follow. In the meantime, pioneers are needed to show the way.<sup>2</sup>

The way is being pioneered by several forward looking textbook authors and by at least one state. This study includes a number of textbooks and study guides which fill the gaps

<sup>1</sup> Elaine Exton, "Views on Textbook Trends", American School Board Journal, Vol. 119 (October, 1949), 534.

<sup>2</sup> Gordon O. Wilber, Industrial Arts in General Education, pp. 96-97, Scranton: International Textbook Co., 1948.

existing when Wilber's book was written only a few years ago.

Williams<sup>1</sup> produced a book in 1940 which pioneered in this field. The book is an exploratory approach to the arts and industries and grew out of his experiences with the "Laboratory of Industry" experiment at Oberlin, Ohio. The book is now under revision and could not be included under the limiting criteria of this study. It is largely devoted to the development of general educational subject matter which had rarely been treated as industrial arts material before that time.

Notable progress has been made in providing content for the study of related materials during the past five years. Materials have been developed by the State of New York which provide related materials for comprehensive general shop courses in all of the major areas of industrial arts. These materials are available for general use through Delmar Publishers, Albany, New York, and are one of the most promising new developments in the field of industrial arts literature. The textbooks are study guides and do not provide complete materials, but they are thoroughly referenced and contain some of the basic materials to be presented or

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<sup>1</sup>Walter R. Williams, Jr., Exploring the Arts and Industries, Scranton: International Textbook Co., 1940.

used in the laboratory.

Several authors now include interpretive and correlative materials in textbooks. The practice of correlating general education materials with technical information is comparatively new. Most of the books containing these materials have copyrights less than six years old. One exception is a drawing textbook dating back to 1930<sup>1</sup> which has done a good job of correlation of information with technical subject matter. Many of the textbooks available are characterized by an "added on" approach to general information and are attempts to meet this need in a rather crude way. The prospect for good textbooks, meeting all of the objectives of industrial arts, seems rather promising when recent publications are examined.

Most of the books which were developed prior to 1948 seem to be books developed for specialization or for a combined use by industrial arts and industrial-vocational education. The particularly significant feature of these books, when examined for industrial arts use, is their neglect of the general educational values.

#### The Production of Textbooks

In order to understand some of the implications of the textbook it is necessary to understand something of what goes into the production of a textbook. The following brief

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<sup>1</sup>R. A. McGee, and W. W. Sturtevant, General Mechanical Drawings, Milwaukee: The Bruce Publishing Co., 1930, 1935.



description of the process is adapted from Textbooks in Education:<sup>1</sup>

The production of a textbook today is a far cry from the methods of the eighteen-hundreds. The modern publisher performs a service to education that is practically indispensable.

The first step in the production of the textbook is locating the need. The publisher maintains a staff of editors, specialists, and sales representatives to interpret educational needs, translate them into textbooks, sell as many books as possible and demonstrate the use of the books in order to insure their success and continued popularity. The need originates in the classroom. Demonstrators and salesmen, in their contact with school personnel, discover future needs which should be met by textbooks. It should be understood that many of these demonstrators are former school teachers with many years of experience and are therefore able to evaluate needs intelligently.

The second step is the decision to publish. This decision generally calls for several types of evidence. The demand must be assured, cost must be estimated, expected sales must be estimated, and all must add up to a profitable

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<sup>1</sup>The American Textbook Publishers Institute, Textbooks In Education, Gilbert Loveland, editor, pp. 93-121, New York: The American Textbook Institute, 1949.



venture.

The third step is selecting the author. Few books are published from unsolicited manuscripts. Leads to prospective authors are usually provided by the publishers' representatives in the field. Professional writers also help to produce many of the textbooks. They work under the direction of the publisher in putting books into final form. Ideas may be supplied by the teacher-author, but many good teachers do not have the ability to write effectively.

The editor has a basic function in the process. More often than not the author is selected and is under contract before the manuscript is begun. The editor works with the author in planning the publication. Planning requires considerable time. All of the details are worked out in advance in much the same manner that an architect plans a structure, adapting materials and structural features to functions. When details are complete the author makes a first draft. This draft is examined by the editor and may be examined and read by other editors. Other persons not under contract by the publisher may be asked to read the manuscript in order to get the views of a good cross section of textbook specialists and users. The viewpoints of the readers are used as guides for modification of the text in an effort to produce the best product possible. At this point the designer may be asked to help in establish-

ing the proper format and physical makeup of the book. The manuscript is then given to the author to revise. Differences of opinion between author and editor are generally resolved; or the editor has the last word because the publisher will have more money involved in the venture than the author. It may be decided that the materials should be tested before they are published, but since this is an expensive process and rather involved, it is not often done. A specialist in the field covered by the manuscript may be asked to evaluate the revised manuscript for use in the field and to advise the publisher concerning probable sales and popularity of the treatment. When the manuscript is ready (the publisher determines whether materials are ready or not), the manuscript is sent to the printer, who takes the process through the galley-proof stage. The proofs are sent back and corrections noted by the author and editor. Frequently extra proofs are run and sent to various people in school work for suggestions. When all suggestions are in and corrections are made, the proofs are marked for page makeup according to the approved format of the book. Page proofs which have the illustrative materials included are printed and proof-read. Plates are prepared and the book goes to the printer for the final stage.

While this is only a brief description of the process, the amount of work that goes into a textbook is shown.

It is also evident that the product is often as much the work of the editor as of the author. A fact that should not be missed is that the textbook publisher virtually controls the textbook field and the quality of the textbook. The major contributions of teachers and others are to make needs known and to choose suitable textbooks. The professional attitude of the publisher and competition are the two chief factors in textbook quality and in textbook improvement. Teacher demands for textbooks serve as a control when the competitive market is operating.

## CHAPTER IV

### CLASSIFICATION OF INDUSTRIAL ARTS TEXTBOOKS

The classification of textbooks for industrial arts use is at present a very difficult task for several reasons. Probably the most confusing element of the task is the nature of industrial arts subject matter. Industrial arts includes a complex of many trade and industrial related subjects. An examination of The Biennial Report of The U. S. Office of Education, 1948 - 1949<sup>1</sup> reveals the following facts:

1. Industrial arts as reported consists of eight different major categories. These are: (in order of popularity) general shop, woodworking, mechanical drawing, metalwork, printing, electrical work, handicrafts and automobile mechanics.
2. Certain minor categories are reported. Examples are home mechanics, photography, ceramics, mathematics, plastics, et cetera. These constitute less than one-half of one percent of the total offering in industrial arts.
3. The major categories are often composed of several subdivisions. For example, metal work is composed of general metals, machine shop, sheet metal, foundry, forging, welding, et cetera, which correspond to trades within the general area.
4. Comprehensive general shop, as reported, may be composed of any combination of the separately reported categories.

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<sup>1</sup>U. S. Office of Education, op. cit., pp. 63-64.

The textbooks submitted for this study also serve to illustrate the complexity of subject matter. The following subjects are dealt with by books provided by textbook publishers for industrial arts use: Automobile mechanics, art metals, ceramics, drawing, electricity, foundry, general crafts, general metals, general references (materials, processes, shop safety and finishing) printing, home mechanics, leathercraft, machine shop, plastics, sheet metals, welding, forging, and woodworking.

In addition to the multiplicity of subject matter, the complexity of the task is compounded by the lack of standard classification categories. In one situation ceramics may be considered as only pottery. In another situation ceramics may include pottery making, concrete work, keene cement work, brick making, the use of plastics and the use of glass. Graphic arts may be used to designate hand composition only, or, it may incorporate printing, silk screen work, linoleum block printing, bookbinding and other related subjects.

A third confusing factor is the relationship between industrial arts work and industrial-vocational education. The two areas have reached no agreement upon basic relationships. It is true that many statements have been issued by members of each area, but no agreement has been achieved. This element has been discussed in Chapter II.

A fourth factor leading to the difficulty of classification is the lack of basic agreements within the ranks of industrial arts teachers as to philosophy and curricular principles for the subject area. Relationships to education as a whole, to the learner, to the supporting society, and to other subject matter areas have not been generally agreed upon by industrial arts teaching personnel, and certainly no agreement has been reached with personnel in other areas.

A fifth confusing factor is the way in which textbooks are classified by publishers. In general, they classify all textbooks dealing with trades and industries under one broad classification. Books are classified as "technical" "trades", or may be classified by subject titles, as "woodworking" or "machine shop". An examination of almost any publisher's catalogue will illustrate this condition. Books suitable for engineering will be found in the same classification with those suitable for elementary craft work.

A sixth factor is the lack of textbooks prepared specifically for industrial arts use. The need for textbooks has been met by using textbooks from other fields. This is particularly evident from an examination of the authors' prefaces to the textbooks submitted for this study. Table 6, Page 108 shows that only 24.4 percent of the books



submitted are, according to the statements by the authors represented, especially designed for industrial arts use. This figure should be considered in relation to the assumption that the books submitted are the best industrial arts textbooks in the field, since publishers were asked to submit industrial arts texts and were not asked to submit books by titles or subjects. For this reason the percentage is suspected of being much higher than that which an examination of all books being used by industrial arts classes would reveal. The textbooks which are most frequently adopted or adapted deal with industrial-vocational education, crafts or avocation, and engineering. Books from the last named area are used particularly in college work. French's Engineering Drawing is probably the classic example of this type of "borrowing".

Some of the authors label their products for both industrial arts and industrial-vocational education. A count reveals that, of the books covered by this study, 6.6 percent fall into this category. If this figure is added to that for industrial arts (24.4), the books written for industrial arts amount to approximately one-third of those examined. Specialization accounts for 16.5 percent of the books, 25.6 percent are directed to crafts and avocational use, and 27.0 percent are not directed to any particular use. These figures show that statements by authors cannot be used as a means of satisfactorily classifying textbooks.

The foregoing statements and illustrations are given as a background to show the complexity of the problem and to show the need for a methodical way in which to classify textbooks so that intelligent selection of textbooks suitable for each particular use may be made.

#### Comparisons of Industrial Arts and Industrial-Vocational Textbooks

The crucial issue in textbook classification is the separation of industrial arts and industrial-vocational textbooks. This issue must be decided upon the bases of definition, philosophy, and the closely related matters of method and curriculum. The relationships which exist between the two areas as well as the differences have been shown in Chapter II. Textbooks written by liberal industrial-vocational writers as beginning treatments and those written by thoroughgoing industrial arts writers are indistinguishable through an analytic approach. If content is used as the criterion of acceptability, these books may be considered as usable in either field.

Moving away from this point of agreement in either direction, the materials become progressively different in content and in emphases. Beginning courses for industrial arts and advanced specialization courses for industrial-vocational education show very little resemblance to each other except for treatment of common subjects. The industrial

vocational specialization materials contain very little content other than that suited for learning to perform the technical skills of a trade. Emphasis is upon saleable skills. The related information is for achieving expertness and not for understanding the contribution of the trade to social or cultural values. Operations and procedures are definite step-by-step activities taken from job analyses. The tools and machinery described are identical to those used in industry.

Differences become more pronounced as industrial arts materials developed for junior high school use are examined. The popularity of industrial arts courses in junior high schools throughout the United States is a result of the need for exploratory experiences at the junior high school level and has caused materials to be developed for industrial arts which are exploratory or orientational in nature. This area represents a large part of all industrial arts work in the schools. According to the United States Office of Education, 48.2 percent of all junior high school pupils were enrolled in industrial arts classes in the 1948-1949 school year.<sup>1</sup> The materials developed for the use of junior high schools are characterized by a high proportion of related information dealing with occupations, the interpretation

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<sup>1</sup>The U. S. Office of Education, op. cit., p. 19.

of the nature of our culture, historical development of industry, civic and social development of youth, and with the development of recreational and hobby interests. All materials do not contain all of these emphases but generally some of them are present.

Resolving the problem of separation of industrial arts and industrial-vocational materials hinges upon the differences rather than the relationships. Industrial arts materials may have specialization emphasis, but neglect of the general education materials invalidates textbooks for inclusion in industrial arts categories for other than reference purposes. Specialization materials may have general education emphases included without destroying their usefulness for vocational-industrial education; in fact, the liberal vocational-industrial author will include materials of this type. The inclusion of specialization emphasis, the inclusion of a strong technical information treatment, and strong emphasis upon operations and procedures fill the requirements for industrial-vocational specialization.

#### The Crafts or Avocational Textbook

The adoption of, or adaptation, of crafts books presents another problem for this study. These books are written neither for industrial arts nor for industrial-

vocational education. The use of these books in either approach is questionable, since the materials often are not suitable. The crafts approach stresses "how to do" and does not give proper emphasis to technical information or general information, and seldom includes general education materials. The avocational and manipulative objectives of industrial arts may be achieved through the use of this approach; however, it is very unlikely that any course is justifiable upon this basis alone. It must be assumed that a strong industrial arts program will supplement these books if they are used at all. Some of these books may prove valuable for references, and in a few cases they contain sufficient general education content to warrant their use in industrial arts.

#### Subject Areas

Several methods could be devised for classifying books for subject areas. These methods might all be placed in two groups. One group would contain different logical arrangements which could be developed. The second group would consist of categories empirically derived from practices in the field. A method from the first group would be a more systematic procedure but would not be immediately applicable to the conditions revealed to exist through an analysis of The Biennial Survey of the U. S. Office of Edu-

cation. It is hoped that the analysis presented in this study will be applicable to some of the problems existing in industrial arts education; therefore, the above report will be followed as nearly as possible in labeling subject areas. The major subject areas will be designated by titles as reported by the United States Office of Education<sup>1</sup> as follows:

1. General Shop
2. Woodworking
3. Mechanical Drawing
4. Metalwork
5. Printing
6. Electrical Work
7. Handcrafts
8. Automobile Mechanics

Minor areas will use classification titles from this report as follows:

1. Home Mechanics
2. Photography
3. Ceramics
4. Industrial Arts Mathematics
5. Plastics

#### Objectives of Industrial Arts

Nine categories are used to designate the objectives of industrial arts which textbooks may be expected to achieve if the materials are used as the textbook directs. This may seem to imply that good method and teaching organized around a textbook are synonymous. This is not the intent of the

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<sup>1</sup>U. S. Office of Education, op. cit., pp. 63-64.



statement. The assumption is that judgment must be made in terms of intended use and not by a preconceived standard of classroom method.

A second assumption is made that all competent teachers and textbook writers should be concerned with the achievement of over-all objectives of industrial arts. These assumptions may not seem compatible to the careful reader, because in one case the viewpoint of the author is considered as very pertinent and in the next an outside criterion is used. Perhaps an analogy is the best means of explaining this conflict and of showing the underlying logic. In the building trade division of labor is used. The carpenter works with wood, the mason with brick and mortar, and the painter with paints and finishing materials. The architect is responsible for overall planning and with specifications for the structure. The end is a structure with certain characteristics. In order to obtain the finished product all concerned work with their respective materials conforming to the general plan and specifications of the architect who has deduced these requirements from the end product desired. Each workman works in his own way to achieve results which are acceptable or which meet standard specifications. Ends to be achieved are dictated by the general plan; how the ends (objectives) are achieved depends upon the methods best suited to the workman. It makes

little difference whether the carpenter uses the saw with his left or right hand; the fit is the important factor in the situation. Whether the teacher uses a demonstration or a project is not too important; it is the learning which occurs that is important. Learning and achievement of objectives are synonymous.

The nine objectives used in this study have been derived by a process of reducing various statements to nine "common denominators" or objectives. Fifteen statements of objectives taken from the professional literature in the field of industrial arts were recorded on cards. Statements of objectives were divided into single factors or objectives and each placed upon a card. The cards were then arranged in trial groupings for homogeneous emphases. Each group was summarized into a composite objective stating the particular single emphasis of the group. Statements which were not in harmony with the single objectives were removed and placed in new groupings to achieve a complete set of unique statements or objectives. By trial and error process overlappings and incongruences were eliminated. The final result was then checked against a statement of objectives found in the Evaluating Criteria,<sup>1</sup> for both com-

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<sup>1</sup>Cooperative Study of Secondary-School Standards, Evaluative Criteria, Section D-9, pp. 123-127, Washington: Cooperative Study of Secondary-School Standards, 1950.

pleteness and intent. Definitions of the objectives were obtained by an examination of the original statements used in forming the composites, and by analyses of the factors which are found in textbooks for achieving objectives. These factors were derived by deduction, but they were tested by trials upon various textbooks to ascertain whether the factors could be identified in textbooks, whether these factors were consistently found in books, and whether overlappings and ambiguities were present. By a process of trial and error the following definitive factors emerged:

<u>Objectives</u>	<u>Definitive factors</u>
A. Manipulation	1. Tool descriptions 2. Operations and procedures 3. Material descriptions 4. Projects and problems
B. Technical Skill and Knowledge	The factors contained in the objective of manipulation plus -- 5. General information 6. Technical information 7. Design and planning information
C. Consumer Skill and Information	All of the factors in the two objectives above plus -- 8. Consumer information
D. Orientation to Technology	All of the above factors plus -- 9. Interpretative information
E. Guidance	10. All of the factors previously listed plus -- Occupational information
F. Personal safety	All factors through number 7 plus -- 11. Safety information

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|-------------------------|--|
| G. Specialization       | All factors listed above excepting numbers 8, 9, and 10. These three may or may not be included<br>12. Specialization emphases |
| H. Avocation            | All factors through number 4 plus --<br>13. Avocational emphasis   |
| I. Personal Development | Practically any combination of factors listed plus --<br>14. Values and attitudinal statements                                 |

The objectives and factors have been arranged in an order which facilitates a recombination into objectives. The relationship of factors and objectives are more easily seen in Table 1, which uses the idea of the progress chart to express these relationships. Each of the factors are defined below.

#### Criteria for Indicating Degree of Factor Emphasis

In order to discriminate between mere inclusion and a complete treatment of a factor the following symbols and general definitions are used for factor strength designation:

- X\* - to designate superior treatment of the factor.  
The factor is presented in a complete and detailed way suitable to the purpose intended.  
Complete adequacy.
- X - to designate an adequate treatment. The treatment meets general requirements.
- (X) - to designate a weak or poor treatment of the factor.  
The factor is included by the author but it is not satisfactorily treated.

TABLE 1  
RELATIONSHIPS OF CONTENT FACTORS TO  
OBJECTIVES OF INDUSTRIAL ARTS

CONTENT FACTORS	OBJECTIVES									
		Manipulation	Technical Skill and Knowledge	Consumer Skill and Knowledge	Orientation to Technology	Guidance	Personal Safety	Specialization	Avocation	Personal Development
Tool Description .....	X	X	X	X	X	X	X	X	X	X
Operations and Procedures .....	X	X	X	X	X	X	X	X	X	X
Material Description .....	X	X	X	X	X	X	X	X	X	X
Projects .....	X	X	X	X	X	X	X	X	X	X
General Information .....		X	X	X	X		X	X	X	
Technical Information .....		X	X	X	X	X	X	X	X	
Design and Planning Information.			X	X	X	X	X	X	X	
Consumer Information .....			X	X		X	X		X	
Interpretative Information.....				X	X		X		X	
Occupational Information .....					X		X		X	
Safety Information .....						X	X	X	X	
Specialization Emphases .....							X		X	
Avocational Emphases .....								X	X	
Values and Attitudinal In- formation .....										X

X - designates inclusion of factor in the objective.

### Definitions of Content Factors

Tool Descriptions.--Descriptive materials concerning tools, either written or pictorial, with accompanying explanatory notes.

- X\* - Superior. Technical and detailed descriptive materials that fully describe tools in terms of construction, functioning parts, and use.
- X - Acceptable. Descriptive materials without detailed information; generally statements of use and general description.
- (X) - Weak. Descriptions generally in terms of use without details of construction or an illustration without notes of description.

Operations and Procedures.--Statements of "how to do" or how to perform jobs.

- X\* - Superior. Detailed steps in performance; descriptions of technical details involving the operator, tools, and materials.
- X - Acceptable. Gives directions without details of technique; often expresses only "do" and the sequential order, or gives general directions which are not explicit.
- (X) - Weak. Gives little detail, and very little attention to "how."

Material Descriptions.--Descriptions of physical characteristics, technical specifications for use, chemical properties, relationships to uses made, et cetera.

- X\* - Superior. With complete description in terms of physical, chemical, and other technical characteristics and descriptions in terms of the relationships of characteristics to use.



- X - Acceptable. General characteristics with some detailed information; general physical properties with relationship to use; or uses with some relationships to physical properties.
- (X) - Weak. General descriptions of color, et cetera, or of simple use with little or no explanation leading to the understanding of technical qualities.

Projects and Problems.--Exercises, jobs, experiments,

or articles to be constructed for purposes of developing understanding and skills.

- X\* - Directly related to skills to be learned; makes use of tools and information by direct application; well designed, variety for individual selection, and with both "boy or youth interest" and utility; concrete problems related to real situations and involving problem-solving and planning techniques.
- X - Acceptable. Related to skills in tool and material uses, but the selection is limited. Designs do not show a high degree of imagination, but are suited to the learning situation by providing planning and problem-solving conditions.
- (X) - Poorly designed projects and problems which are not well suited to interest and to the learning situation.

General Information.--Informational treatments which

are not directly connected with tools, operations, materials, the production of a project, or solution of a problem. Information of a non-technical nature dealing with the production of materials or products and their uses, transportation, how sold, et cetera.

- X\* - Comprehensive and pertinent information, well integrated into the text.
- X - Pertinent but lacking in comprehensiveness. Fairly complete.

- (X) - Not pertinent. Not sufficiently complete to be orientational or educational.

Technical Information.--Information of a technical nature. Information pertinent to the performance and planning of operations and to design. Physical qualities, chemical analyses, working characteristics, dimensions, formulae, calculation constants, et cetera.

General strength criteria are used.

Design and Planning Information.--Information on how to plan a project, problem solution (general), or the elements of design as applied to the particular problems and projects contained in the subject matter.

General strength criteria are used.

Consumer Information.--Evaluative information and procedures relative to the selection and use of products and services by the individual consumer. Instructional materials in the use, care, adjustment and repair of products used in the home and in the care and general maintenance of the home itself.

General strength criteria are used.

Interpretive Information.--Explanations and discussions of relationships among individuals and discussions of the relationship between factors connected with the production and use of industrial products, and factors connected with living in a technological democracy, and the economic

and the historical development of American institutions as influenced by technology.

General criteria of strength are used.

Occupational Information.--Information relative to working conditions, personal-physical requirements, educational requirements, opportunities and disadvantages, employment trends, obtaining employment, et cetera.

General criteria of strength are used.

Safety Information.--Statements of rules and principles of safe working practices.

General criterion of strength are used.

Specialization Emphases.--Emphases upon speed and accuracy to meet skill demands for entering a trade. Projects and procedures taken directly from industry. Narrow subject field. Related information pertinent to trade only.

General criteria for strength are used.

Avocational Emphasis.--Emphasis upon development of recreational skills, hobbies, or crafts. Emphasis upon the use of skills as a recreational medium. Projects and procedures of hobby or recreational nature. Designate only for inclusion. This emphasis is either included or is omitted.

Attitudinal and Values Information or Statements.--Statements or discussion of values, morality, ethics, et cetera. Statements dealing with good workmanship, honesty,

cooperation, responsibility, et cetera. Statements concerning social justice, working relationships, trade union and management relationships, political relationships, international relationships, race - color relationships, et cetera.

General strength criteria are used.

#### Categories of Appropriate Use

The criteria for defining appropriate use is inherent in the definitions given in Chapter I. All of the objectives used have industrial arts implications. Specialization composites are defined by factors of technical information, operations and procedures and by specialization emphases. This characterization is derived from the definition of specialization as used in this study and by inductive derivation from practices of authors who state that their books are written for specialization purposes.

A third category is the "crafts approach". These books contain manipulative factors and avocational emphases. Some of these books also have a factor which is not included in the inductive definition derived by factoring. This "creative approach" is an organizational feature which may not be apparent to the casual observer. This approach features strong planning and design and gradually eliminates projects in favor of "creative planning" by the student. This feature is generally carefully pointed out in the preface of

the book.

The Inductive Process Used in  
Developing Content Patterns

The inductive process is used in establishing factor patterns. This procedure should be thoroughly understood by the reader if he is to clearly understand the derivation and implications of the data presented.

Simply stated, the procedure by which category patterns were derived is as follows:

1. Books were examined for factors of content by carefully reading the preface, the table of contents and at least one or two chapters to discover the organization and to determine the type of materials contained in the text of the book. Other chapters were carefully scanned but were not read word by word.
2. Common factors of books which authors designated for a particular use were noted.
3. By a process of inspection, and by factor analysis as used in test building, the factors that discriminate between books designed for different uses were isolated. These factors become the bases of selection for appropriate uses.
4. Other books were examined and the factors recorded. Using only symbols and numerical identifications, all books were described for factor content. These books were then placed in the "use" categories by the patterns that were found to define the categories. The validity of the pattern was determined by comparison with the authors' stated intention in writing the book. Where accurate predictions were possible the pattern was assumed to measure the same thing that authors include in books for the purposes stated. If the predictive accuracy was poor, the pattern did not measure what it purported to measure and further refinements and trials were made.



The patterns used in this study are not perfected to the extent that all books can be classified by a pattern. Some books were not written with a clear purpose in mind; others were written to sell to two fields and make a combined pattern. A few books seem to possess no pattern and are practically useless as textbooks because of a lack of direction and organization. One advantage in the system is that it facilitates identification of these books by their failure to conform to a pattern. In experimental tests it has been found that a novice with fifteen minutes instruction is able to locate a high proportion of the books for any particular use and that, while not all of the books that authors say should be in a particular category will be located, no books belonging to another definite classification should be selected. Tests also show that all of the books with good content for a particular use will be selected. The books that cannot be classified generally are those which authors do not direct to any specific purpose. An individual with considerable experience is able to place most of these as being in this "no man's land".

#### Recognition of Factor Content

This study is based upon the premise that a factor must be observable through evidence in the written text of the book to be present. No factor should be implied that depends upon interpretation from sources other than the



materials presented. Assumptions are also made that the teacher is competent, that the material will be read and understood by the student, and that appropriate activities suggested by the textbook will be engaged in. It is further assumed that the activity engaged in by the student will lead to learnings and changed patterns of behavior. While it may not be considered good pedagogical practice, it is assumed that the teacher will follow the textbook in matters of organization and that the materials will be interpreted as written. If books are examined for industrial arts, judgments of strength must necessarily be made from reference to industrial arts purposes and objectives. This procedure does not produce unbiased data when books written for other purposes are judged; but to judge from a constantly changing point of reference would invalidate the study. At best, the judgments represent to a degree the bias of the judge and the procedure cannot be expected to produce a pure measure of content. Validity claims are based on internal and logical consistency and upon predictive accuracy in use. At present there are no criteria for testing validity except by comparison with the authors' stated purposes.

#### Recording Data

All data for this study <sup>were</sup> ~~was~~ recorded upon 5" x 8" index cards. In recording the information, the bibliographic information was recorded first, followed by a one-line des-

cription of the book. (See appendix A for form used). The approach to subject matter was next recorded. Textbook subject content was taken from the table of contents. In some cases special features were also recorded. Recording these materials proved helpful in becoming orientated to each book.

After the above items had been recorded, the author's preface and the first two chapters were read to determine the style and content of the chapters. The remaining materials were scanned to discover any change in plan or content of the chapters.

After the book had been examined the content factors were recorded, using symbols as explained under "The Use of Symbols", page 82. Both content factors and objectives were recorded. It should be pointed out that factors make up objectives. Recording of both is unnecessary except to provide a check upon the objectivity of the analysis. Notes were placed on the reverse of each card to serve as personal references and are not a part of this study. The time required to complete books varied. Some books required more than two hours while others required less than fifteen minutes. The average time required was one hour and fifteen minutes. Re-examination of several of the books examined first was necessary in order to offset discrepancies produced through differences in levels of examination experience.

A second examination was also required in some cases where factors and objectives recorded were not consistent.

The last step in recording data was to place on a single card the content factors and objectives from each card in a particular subject area. These cards give a graphic indication of the coverage and treatment of the subject matter area. Only numbers and symbols were used to record these data. Arranging individual book cards in order of the number of included factors helps to visualize results. Numerical sequence can be determined easily by assigning numbers to factor strengths. "Weak content" should be assigned a value of one; "acceptable" should be assigned two units, and "superior" a value of three. This process tends to put industrial arts textbooks at the top of the combined list for each subject area and to place supplementary materials, such as workbooks and narrow references at the bottom of the group. This arrangement results from the definition of industrial arts materials as having the factors common to industrial arts, industrial-vocational education, and crafts, with general education factors added. Crafts and industrial-vocational education textbooks will not be placed in any definite arrangement by this system, since each may have the same number of factors.

### The Use of Symbols

Symbols are very useful in recording data of the type used in this study. The symbols used are taken from the outline of objectives and definitive factors given earlier in this chapter. Alphabetical symbols are used for objectives and numerical symbols are used for content factors. The letter "A" is used for the "Manipulation" objective, the letter "B" is used for "Technical Skill and Knowledge", et cetera. The numeral "1" is used for "Tool Descriptions", "2" is used for "Operations and Procedures", et cetera. The asterisk is used to designate strength of a factor, plain numerals or letters designate acceptable strength, and enclosure in parenthesis is used to designate a weak factor or category.

### Interpretation of Content Factor Patterns

The system of content factoring provides a method for interpreting the appropriate use of textbooks in terms of orientation, specialization and avocational emphases. The system also provides a means for differentiating between books written for general education purposes and those written for specialization and avocational purposes. Other interpretations are also possible for mixed categories of "use".

### Specialization Pattern

The specialization pattern has the following characteristics:

1. Inclusion of specialization emphases
2. Strong inclusion of operations and procedures
3. Strong technical information content
4. General information generally, but not always, weak
5. Avocational emphases nearly always absent
6. Consumer information weak or not included
7. Interpretive information weak or not included
8. Values and attitudinal statements not included
9. Material descriptions may be prominent
10. Tool descriptions may or may not show content strength
11. Projects are often omitted.

In terms of symbols used in this study three major cues are used for identification purposes. The general pattern is indicated by factors 1, 2\*, 3, 4, 5, 6\*, 7, and 12. The first cue is factor 12; if present it is indicative of the author's direction in the book. If factors 2 and 6 are strong the entire content is nearly always specialization. In this pattern factors 1, 3, and 4 will sometimes be missing and 5 may sometimes be weak. Inclusion of other factors may make the text suitable for both industrial arts and industrial vocational education. Weakness in factors 2 and 6 should be considered as disqualification for this category.

### Orientation or Industrial Arts Pattern

The orientation pattern is recognized by the following characteristics:

1. Inclusion of nearly all of the factors.
2. Strength shown in general information, interpretive information, occupational information, avocational emphases and sometimes in values and attitudinal statements.
3. Inclusion of technical information and manipulative factors, tool description, operations and procedures, material descriptions, and projects. Does not preclude orientational emphases.

Industrial arts patterns have certain characteristics which are easily seen. The factors that may be found are 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, and sometimes 12. Factor 11 does not materially affect the pattern. The first indication of content for industrial arts use is factor 14. However, its absence does not preclude industrial arts use. The cues are more easily picked from the group and may serve as a first indication. The specific determiners are content factors numbered 5, 6, 7, 8, 9, and 10. Not more than one of these factors should be missing for good industrial arts use. Factor 7 will be missing in some cases and occasionally factor 8. Superior 5, 8, 9, and 10 factors are highly indicative of industrial arts utility. Factors 1 and 4 are sometimes weak or missing, but these factors should not be given much weight in determining whether the industrial arts pattern is present.



### Combination Pattern

In some cases there will be no definite pattern. All factors will be in strength and all will be included. These books provide for strong general education courses and at the same time are suitable for specialization. It should be thoroughly understood that the liberal industrial-vocational school of thought is practically the same as that held by industrial arts personnel who do not believe in the weak or "watered down" treatment of subject matter. Beginning industrial-vocational work is conceived as exploratory but thoroughgoing by these educators. The two branches of industrial education use the same material for class work in this closely correlated concept without detriment to either.

### Special Cases

In some books, apparently incongruent factors may be found. In many cases this is an indication of a special interest of the author, or of a text written for a specific purpose. Unusual strength in a particular factor or group of factors may indicate a work adopted but not adapted for industrial arts education. Strength in operations and procedures, material description, projects and avocational emphases when found with very weak treatments of other factors indicates the typical crafts approach. These books are generally written for hobbyists and home craftsmen and

are not suited for industrial arts use because only two objectives are possible from the use of these writings. In terms of symbols, crafts patterns are characteristically strong in content 2, 3, 4, and 13. Thirteen is the first cue. If 13 is present, examination should be made to ascertain whether 2, 3, and 4 are acceptable or strong. These two conditions serve to identify this category. If factors 8, 9, and 10 are missing, the evidence is confirmation of the avocational approach. Factor 7 may be included and may be strong. Factor 9 may also appear in some books, particularly those attempting to develop creativity. Factors 12 and 14 are seldom present.

A very high design and planning content is often indicative of textbooks written by authors for the fine arts. These authors also frequently load their books with values and attitudinal statements, avocational emphases, and sometimes with interpretative information.

A pattern found in books borrowed from physical science is the laboratory-theory pattern. These books are characterized by general and technical information, operations and procedures of an experimental nature, projects for experimentation, and very little emphasis upon other materials. The pattern, in symbols, will be very similar to the crafts pattern except for factors 7 and 13, which will not be found. The pattern will be 2, 3, 4, 5, and with

strength in 6 and sometimes 2, 3, and 5. If the book is pure theory without the experimental factors the pattern may be simply a 3, 5, and 6 pattern.

### Testing the Study Hypothesis

For valid and reliable data to be obtained in any study, the basic criteria should be valid; i.e. they should measure what they purport to measure. Since no outside criteria have been developed, the validity of this study can be tested only through comparisons of classifications by the criteria and statements by authors of intended textbook use. In the test the author's statement is taken as correct and the criteria of the study are used to predict the authors' statements of use. Since books which are not directed to any use are expected to change, they were removed from the group as a spurious factor. Books with only project content were also removed because they are not textbooks and cannot be directed. The remaining one hundred nine books were tabulated for changes. Seventeen changes were made. If only the changes that alter the authors' statements of use are counted, the number is fourteen and one-half changes. The latter figure represents the total number of errors; the first figure enumerates the changes made. Calculating the percentage of change gives 15.6 percent. The percentage of error is 13.3 percent. If books treating electricity

which cannot be classified into industrial and crafts categories are removed, the error is reduced to eleven and one-half changes, or 10.8 percent error. This last figure is the most accurate estimate of the reliability of the instrument because it considers all of the predictable possibilities of the criteria. This does not necessarily mean that the criteria are inaccurate, but rather that in slightly more than one case in ten, the factor-synthesis system predicts a different use from that to which the author has directed his writing. The error may be that of the author; it may be due to needed refinement in the criteria; or it may be due to errors in personal judgment of the judge in the original analyses of factor content. With the completion of other studies it may be possible to remove some of the error; or, it may be shown that the author is responsible for the error and that the criterion is valid.

The degree of accuracy shown is satisfactory for use under the limitations of the manner in which the accuracy is calculated. The limitations are: (1) Non-textbook treatments, which include project and reference books, should not be judged without using an added category, and (3) Non-directed books must be assumed to fall into appropriate categories in nine out of ten cases if the accuracy of the instrument is to hold. In use the criteria should be expected to indicate the author's viewpoint in nine cases out of each

ten, or to be 66 percent better than guessing when three categories are involved. If the fourth category for electricity is included, the accuracy represents a predictability of 85 percent better than guessing or chance.

In practice the criteria will be found to be very usable because of the discriminating accuracy of the instrument in separating industrial arts, specialization, and crafts or avocational books. The instrument will not classify all books but will leave about thirteen percent unclassified or in a non-directed category. The system tends to place books by their factor strengths. Textbooks will not be classified for industrial arts use without inclusion of necessary materials for achieving industrial arts objectives. Content in excess of that necessary for one use may suit the book for additional uses but never restricts the use of the book. Where definite factor content patterns exist, the user of the system can be reasonably sure that the book selected is applicable. It is only the nebulous book that is not classified. It is highly probable that these books are unsuitable for textbook use; therefore, the system performs a second service in not selecting books which do not have definite direction.

The evidence for reliability and validity of the criterion has been presented as an effort to enable the reader to assess to some degree the significance of the



instrument for use and to evaluate the conclusions based upon the data presented.

### Textbook Selection

Textbook selection is not a primary purpose of this study but is worthy of some space. By experimenting with the factor descriptive system it was discovered that it is possible to arrange textbooks in a rank order within each subject matter area. By close study this rank order is found to be the same order which the books would occupy if arranged by other methods by competent judges. This system also is found to place textbooks which authors write for industrial arts purposes high in the order, and specialization books low in the order. One exception to this rule is found in the fact that books specifically written for both fields tend to rank higher than books written for either industrial arts or industrial-vocational use, and in a few exceptional cases to rank high books that are not directed to either field. As a general rule books written for both branches of industrial education which authors do not direct to either field will be found to rank near the center of the group.

The ranking system does not serve as a criterion for final selection of textbooks, but it may serve as a screening device to narrow the number of textbooks that should receive further study by the individuals or groups concerned



with selection.

The procedure for ranking is as follows:

1. Using symbols for factors, rate the factors as follows: 1 for weak content, 2 for average acceptable content, and 3 for superior content.
2. Add the total of the factors, using the numbers assigned for degree of strength.
3. Rank high totals high, and low totals low. Arrange in the order of the totals.
4. Books receiving identical scores should be examined subjectively for ranking or may be considered as equal.
5. Differences in scores of less than two units should not be considered as highly significant.

This system is not suitable for ranking groups in which books treating narrow subjects are not separated from those treating broad subject areas. As an example, books dealing with machine woodworking should not be ranked with books for general woodworking. Books for silk screen should not be ranked with books for graphic arts in general. The high ranking books will be found to contain suitable materials for industrial arts use, but final selection should be upon individual merit and the specific purposes to be served by the textbook.

In selection of textbooks for specific purposes the following suggestions are offered:

1. Agreements should be made upon the objectives of the course in which the book is to be used. These

objectives should be stated in terms of content factors. Using symbols facilitates the search if books have been examined previously and have been rated for factor content.

2. The specified factor content resulting from the agreement upon objectives should be compared with the content of books which have been examined for content factors. Selection of one or two books which seem to have the factors desired should be made.

3. A more thorough study of the books selected should be made in order to make comparisons of each factor.

If a jury system is used in selection, this procedure will be found to be useful in securing objectivity, because content is defined in the light of objectives, all textbooks are judged upon the same factors by each judge, and final judgments are made in the light of evidence and not from purely subjective factors and personal bias.

#### Selection of Supplementary Books

Frequently, under present conditions, those who select textbooks will not be able to select single books which meet all of the objectives of a good industrial arts program. The factoring system described in this study provides an easy solution to this problem in that two or more books with

strengths in particular factors may be selected in order to provide strength in all of the factors needed. In some instances two books will not provide all of the factors, and a third reference book may be needed; however, an examination of the textbooks submitted for this study indicates that two books will be found sufficient for many of the subjects taught, and in some cases one book provides good coverage of all of the pertinent industrial arts objectives.

The importance of selecting one book for organization and others for supplementation must be understood. Selection of two similar textbooks will not solve the problem of complete treatment since both books will cover the same factors. Textbooks written for different purposes will contain different factors of content but will also have differing organizations. If two textbooks are selected for content coverage, both cannot be used for organization because to do so would result in confusion and disorganization. The only practical solution is to select one basic text for organization and to treat other books as references to be integrated through the course of study.

The procedure of following a textbook has been severely criticized by some and defended by others. The suggestions given are not for those who are strong in organizational technique, but for those who find it useful to adapt rather than to initiate. It is better to adapt wisely than

to organize poor materials just for the sake of being different. Many of the courses of study used in industrial arts are not unique but are built upon the strengths of good textbooks. Emphasis should be upon strong courses rather than upon the use of diverse materials.

### Summary

Classification of textbooks presents a complex problem. Factors leading to this complexity are:

1. The subject matter is not single; it is complex.
2. Standard procedures for classifying the content of single subject areas have not been defined.
3. The basic relationships of industrial arts and industrial-vocational education have not been defined.
4. Philosophy and curriculum matters in industrial arts have not been agreed upon by the professional personnel concerned with industrial arts education.
5. Textbooks have not been written for industrial arts use that are acceptable to all teachers and as a consequence "borrowing" has confused issues.
6. Authors' labels are not reliable indices to use of textbooks.

Textbooks are classified in this study in the following categories:

1. Subject area
2. Industrial arts (by objectives and content factor analysis)
3. Specialization textbooks for use by industrial-vocational education and by semi-specialized unit courses in industrial arts.

4. Crafts or avocational approach
5. General reference use for industrial arts and industrial-vocational education.

## CHAPTER V

### PRESENTATION AND INTERPRETATION OF DATA

The materials presented in the preceding chapters have developed the background for understanding the data used in this study. This chapter will present the data by descriptive and by graphic means.

The textbook data compiled in this chapter are taken from the books submitted by the publishers. A total of 152 books are represented. One book was not submitted, but it is included as the only book available for the comprehensive general shop. It was published by a company which does not specialize in industrial arts textbooks and was secured from the Education Library, University of Florida.<sup>1</sup>

Data concerning offerings were taken from the United States Office of Education study of Secondary Enrollment<sup>1</sup> made during 1948-49.

Textbook data were collected under the conditions described in Chapter IV, and under the limitations of Chapter I. The data will be presented in the following order:

1. General data and interpretations
2. General analyses
3. Analysis of subject matter areas.

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<sup>1</sup>U. S. Office of Education, op. cit.



### General Data

Averages are often misleading because their use tends to cover up individual characteristics and other pertinent data which are far more useful than the information provided through averages. The data presented in this section should be evaluated in this light, and should be considered as a background for specific data concerning subject matter areas and for general analyses.

### Books Submitted

Each publisher was asked to submit the books which, in his thinking, should be included as industrial arts books. (See Appendix B for letter). This procedure was made necessary by the complexity of classification of published materials existing in the industrial arts textbook field as explained in Chapter IV. If all books having subject matter with possibilities for industrial arts are considered, the books submitted for this study represent approximately one-fourth of those published by the publishers represented. The books submitted fall into several major and minor categories. To make the data meaningful, books are classified in homogeneous groupings. Some books which are not in any definite group are placed in a miscellaneous grouping. The categories "General Reference" and "General Arts and Crafts" contain most of the miscellaneous books not classified elsewhere.

Figure 1, page 99, shows the subject areas for which books were submitted. This graph indicates the subjects and percentages in terms of the total number of books submitted. The observer should see that metalwork comprises the largest number of books, with 19.2 percent of all books included. Handcrafts is second with 17.8 percent, woodwork is third with 15.3 percent, mechanical drawing is fourth, graphic arts is fifth, et cetera, with general shop last with 0.7 percent.

#### Industrial Arts Subject Offerings

Figure 2, page 100, gives the offerings as reported in The Biennial Survey of Education, 1948-49.<sup>1</sup> This graph shows the popularity of each subject area in terms of percentages of the total offerings in industrial arts. It should be seen that general shop leads in popularity of all subject areas with 30.4 percent of all enrollments. Woodworking is second in popularity with 23.6 percent, and drawing accounts for 21.2 percent. The observer should note that the three subjects listed above constitute slightly more than 75.0 percent of all industrial arts offerings. Metalwork is fourth, graphic arts or printing is fifth, electricity is sixth, et cetera.

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<sup>1</sup> U. S. Office of Education, op. cit., pp. 35-36.

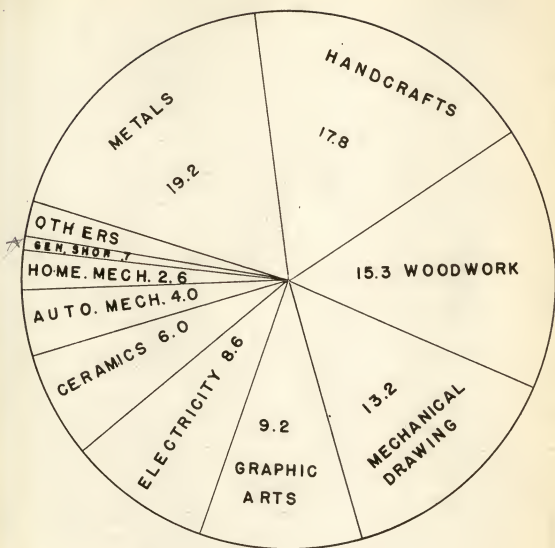


Fig. 1.--Books submitted for study; percentages of total number of books submitted.

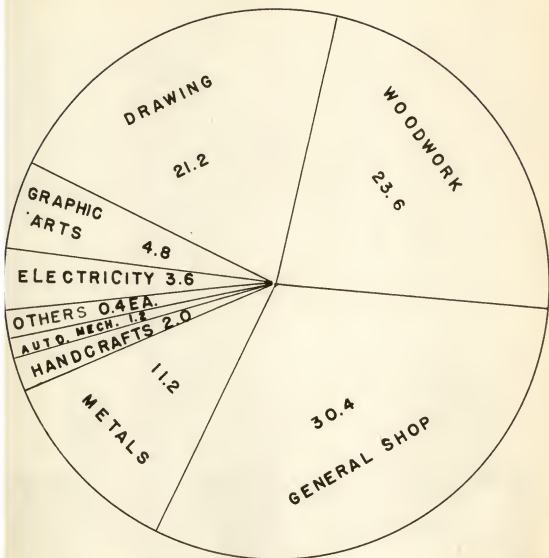


Fig. 2.--Industrial Arts subject offerings; percentages of total offerings.

Figure 3, page 102, compares the percentage of subject offerings with the percentage of books submitted for each area. If the books examined in this study represent a valid sample of the books available, this comparison shows a lack of agreement in needs and in the provision for meeting these needs. It seems apparent that handicrafts has been well taken care of. It should be known in interpreting this particular area, however, that handicrafts books represent a large number of sub-subjects. One or two books in each sub-subject tends to give a disproportional emphasis in terms of percentages. The comparison shows that woodwork and drawing are subjects in which the textbooks examined represent a smaller percentage than the percentage of course popularity in the high school. The one comparison that may be assumed to be alarming is the disproportionate representation in general comprehensive shop textbooks for the needs indicated. It must be assumed that this course is now being taught from a series of books in many cases. By analysis these comparisons will be found to be inaccurate in some cases due to the inclusion of books which are not prepared for industrial arts use.

### Size Trends

The books examined in this study were almost evenly divided as to size. Books approximately seven and one-half inches by ten inches represent 53 percent of the sample,

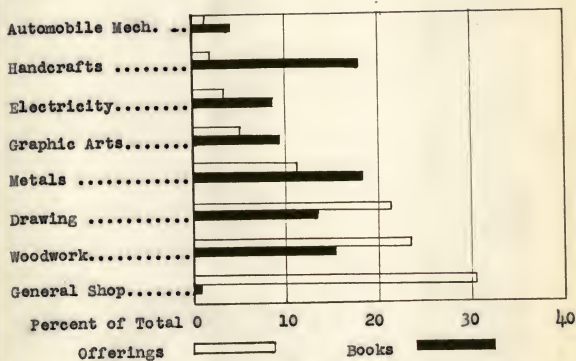


Fig. 3.--Comparison of subject offerings and books submitted.



and those approximately six inches by nine inches represent the remaining 47 percent.

### Authors

It is interesting to note that one author has written, or has cooperated in producing as many as eleven textbooks which are included in this study. Table 2 shows the number of authors who have written more than one textbook and shows the percentage of the total number of books represented. The influence of one author who has had a part in

TABLE 2

FREQUENCY TABLE OF AUTHORS PUBLISHING  
MORE THAN ONE TEXTBOOK

No. Authors	9	5	1	1	1	2 <sup>a</sup>	1 <sup>b</sup>	1 <sup>c</sup>
No. Books Authored	2	3	4	6	7	9	11	12
No. Books Represented	18	15	4	6	7	9	11	12
Percent of Total	11.8	9.9	2.6	4.0	4.6	5.9	7.2	7.9
Percent by Each Author	1.3	2.0	2.6	4.0	4.6	5.9	7.2	7.9

<sup>a</sup>Co-authors of the books represented.

<sup>b</sup>Includes nine books with one co-author and two with a second.

<sup>c</sup>Prepared by the New York State Department of Education.

the production of eleven books is important, since this number represents 7.25 percent of all books examined. Another author has cooperated in producing almost 6 percent of the books examined, and a third author has accounted for the production of almost 5 percent. The total number of books written by authors who write more than one book is seventy-three, or 48 percent of all books examined. If only the books suitable to industrial arts use, as selected by analysis, are considered, the percentages are more significant. An examination of Table 3 will show that

TABLE 3

MULTIPLE PUBLICATIONS BY AUTHORS OF TEXTBOOKS  
SELECTED BY ANALYSIS FOR INDUSTRIAL ARTS USE

No. Authors	6	1	1 <sup>a</sup>	2 <sup>b</sup>	1
No. Books Authored	2	3	5	8	9 <sup>c</sup>
No. Books Represented	12	3	5	8	9
Percent of Total	24.4	6.1	10.2	16.3	18.3
Percent by Each Author	4.1	6.1	10.2	16.3	18.3

<sup>a</sup> Authored by Committee.

<sup>b</sup> Co-authors.

<sup>c</sup> Includes eight books written with one co-author and one book with a second co-author.

one author has taken part in authoring 18.3 percent of all of the textbooks selected as suitable for industrial arts. Two authors working together have authored 16.3 percent of all of the books selected by analysis. It should be pointed out that the nine books listed as written by one author include eight published under joint authorship. The State Department of Education of New York has produced five books or 10.2 percent of the total number selected.

If statements by authors are used to designate the books suitable for textbooks in industrial arts education, the books produced by the joint authors becomes 17.7 percent and nine books become 20.0 percent of the total. Table 4 shows this relationship.

TABLE 4

MULTIPLE PUBLICATIONS BY AUTHORS OF BOOKS WRITTEN FOR  
INDUSTRIAL ARTS BY AUTHORS' STATEMENTS

No. Authors	4	1 <sup>a</sup>	2 <sup>b</sup>	1
No. Books Authored	2	5	8	9 <sup>c</sup>
No. Books Represented	8	5	8	9
Percent by Each Author	4.4	11.1	17.7	20.0
Percent of Total	17.7	11.1	17.7	20.0

<sup>a</sup> Authored by Committee.

<sup>b</sup> Co-authors.

<sup>c</sup> Includes eight books written with one co-author and one book with a second co-author.

Three authors working together produced four books, forty-one books were written by joint authors, thirteen books were produced by committees, and the remaining ninety-four books were the work of single authors. Table 5 shows these relationships in terms of the total number of books included in this study.

TABLE 5  
TEXTBOOKS AUTHORED BY TWO OR MORE AUTHORS

Number of Authors Involved	3	2	Committee
Number of Books Authored	4	41	13
Percentage of the Total Examined	2.6	27.0	7.9

Three authors were involved in the production of 2.6 percent of the books, 27 percent of the books were authored jointly, and committees produced 7.9 percent of the books examined.

#### General Analyses of Content Emphasis

When the content factors for all textbooks are considered as a composite, the specificity of meaning is lost. There is one conclusion, however, that may be drawn from this approach to textbook content. If Figure 4, page 109, is examined, a general tendency is apparent. This graph shows that a marked break in percentage of content

occurs between the factors of technical skill and knowledge and those for general education. This trend is not evidence of a lack of concern for general education content by authors of individual textbooks, but it is evidence of the high percentage of books in the sample which were written for uses other than industrial arts. This evidence of the failure of the books as a group to meet the general education objectives of industrial arts upon a comparative scale with manipulative and technical objectives, has implications for industrial arts education that cannot be ignored. One or more of these implications may apply: (1) The definition of industrial arts is not valid, (2) the textbook writer has not adequately recognized the general education function of industrial arts; or (3) textbooks from other areas were included by the publishers which are weak in general education content for industrial arts use. The evidence does not establish causal relationships. Table 6, page 108, is an aid in interpreting this trend. According to the authors' statements, only forty-seven books were written for industrial arts use. This is approximately one-third of the texts examined. The remaining two-thirds of the books are for crafts or vocational purposes and contain little general education content. The result is practically the same if data from Table 7 are used. These data seem to indicate that the inclusion of books written for other uses is the best explanation of the failure of the

books examined to meet general education objectives.

TABLE 6  
FREQUENCIES OF AUTHORS' STATEMENTS OF  
INTENDED TEXTBOOK USE

Subject Areas	Ind. Arts	Spec.	Both	Crafts	Non- Direct
Automobile Mechanics	2	0	0	0	4
Art Metal	0	0	0	4	2
Ceramics	3	0	0	6	0
Drawing	7	8	2	0	3
Electricity	5	1	1	0	6
Foundry and Welding	0	1	1	0	4
General Crafts	1	0	0	6	0
General Metals	5	2	1	2	3
General Reference	0	2	2	0	1
Graphic Arts	5	3	0	3	3
Home Mechanics	1	0	0	1	2
General Shop	1	0	0	0	0
Leathercraft	0	0	0	0	0
Machine Shop	0	3	0	0	2
Plastics	0	0	1	2	3
Sheet Metal	0	3	1	0	1
Woodworking	7	2	1	6	7
Totals	37	25	10	39	41
Percent of Total	24.4	16.5	6.6	25.6	27.0



When the specialization textbook is used for industrial arts purposes, it may be misleading to both the student and the teacher. Implications are often drawn from the textbook for course content. The student may attach importance to the emphasis of the textbooks, and the teacher may discover too late that he is not teaching industrial arts, but that he is working to overcome the false leads.

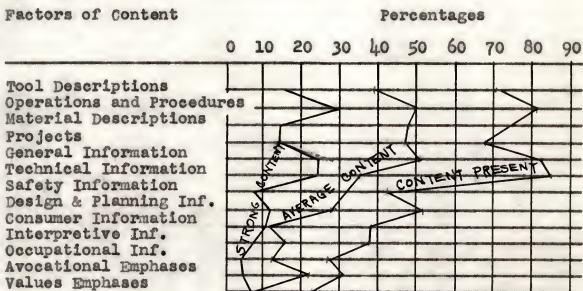


Fig.-4.--Factor Content of Textbooks by Analysis

Reference to Table 7 shows that 25.6 percent of all textbooks submitted for this study are crafts or avocational centered books. The crafts or avocational approach emphasizes manipulative factors and avocational or hobby interests.

This approach presents a special problem for industrial arts teachers closely related to the previous discussion of the use of specialization books. Students, and some teachers, using textbooks for this approach may conclude that activity for the sake of activity is the chief factor in the industrial arts program. These books should not be considered as adequate industrial arts textbooks. They do not mislead; they do not lead at all. No direction is given. The result may be the vibratory program which moves without accomplishing important educational objectives.

If the definition of industrial arts is valid the remedy is apparent. Industrial arts textbooks should be written and selected for industrial arts use. Borrowed books not only limit the possibilities of achieving general education objectives, but in many instances hinder the teacher in his efforts. A textbook which establishes wrong impressions and improper values may prove more harmful than using no textbook at all.

#### General Analysis of Approach Emphases

Two methods are used to tabulate the approach emphases of the textbooks submitted for this study. The first is based on the author's statement in the preface to his book, which often indicates the field or area for which the book is written. The second approach is to determine the usage of the book through factor analysis. The results of

each method will be presented and comparisons made of the results in order to demonstrate the strengths and weaknesses of each and, at the same time, to show the status of textbook emphases. Table 6 tabulates "use" emphases as stated by the author.

The fact that approximately one-sixth of the books included are directed toward specialization use has the implications ascribed previously to the use of specialization and crafts books, but there is one factor which should be discussed. Under the assumption that there is no disjunction between industrial arts and industrial-vocational education, and in light of the close relationship of the two areas at senior high school levels, the inclusion of books written for specialization seems to be necessary and possibly desirable for this level. There seems to be very little basis for objections to the use of these books if they are used in courses elected as the result of interest developed in exploratory and interpretive courses at the junior high school level. They are not suitable, however, for first courses in industrial arts since they neglect many of the general education objectives of industrial arts. The use of these books must be expected to continue until suitable books written specifically for industrial arts use are available.

The number of books directed to industrial arts use

is disappointingly low and indicates to a degree the confusion and lack of direction in the field of industrial arts. The fact that two out of every three books selected by publishers to represent the best that they have to offer for industrial arts are not specifically written for industrial arts use should not be lightly considered. This fact shows the necessity for an examination of textbooks by professional industrial arts personnel in order to re-define and to re-evaluate the purposes of the textbook for use in the teaching field. It is assumed that textbooks reflect the philosophy of the writers who author them. If all of the authors represented by books included in this study are considered as industrial arts writers, then facts seem to indicate a state of indifference toward industrial arts as an integral part of general education. The proportion of crafts books submitted may be an indication that some of the industrial arts programs are based upon a philosophy of industrial arts which values activity for the sake of activity. One of the most significant features of Table 6 is the high percentage of books which authors do not direct to any particular use. More than one-fourth of the books are not directed. Only one explanation is logical. The authors fail to direct their books intentionally. No one writes without a purpose. In view of the part which the editor, who represents the publishing firm, has in the final

form of the book, it is hard to place the responsibility for this omission. In many cases the motive behind the production of non-directed books is suspected to be commercialism.

A second feature of the table is the number of books directed by authors to crafts or avocational emphases. One-fourth of the books are classified in this category. When this fact is considered in relation to the way in which the books were selected for the study, there seems to be an indication that textbook publishers do not differentiate between crafts books and industrial arts books. The proportion of these books is too high to suspect their inclusion to be by chance or by coincidence. If selections were made in terms of use, it is evident that the industrial arts teacher is using a very high proportion of books with crafts emphases. In either case, a need is indicated for better criteria of textbook selection and for textbooks better suited to industrial arts purposes. The crafts books are designed primarily for manipulative-avocational objectives and do not consider all industrial arts objectives. Their use cannot be justified upon the base of the narrow objectives for which they provide.

Table 7 shows the results of the use of factor analysis and synthesis for classifying the textbooks included in this study. The first difference to be noted



is the decrease in the number of non-directed books.

The use of analysis provides classification of use for one-half of the books which authors did not classify.

However, it should be noted that 13.2 percent of the books remain in the non-directed category. Some books are not classifiable under the categories used in the table. Two additional categories would reduce the number of non-classified books to eleven. The percentage of unclassified books would then be 7.25. The two additional categories are:

- (1) a combination crafts and specialization pattern and
- (2) a theory-laboratory pattern. The first is a definitive pattern for handicrafts as used in both industrial applications and for avocational use. This particular approach is based upon a different concept of crafts from that held by the "activity for the sake of activity" school. The end product is a saleable item, and emphasis is placed upon technical information and upon operations and procedures for making a saleable product. The laboratory-theory pattern is typical for the testing of theory in a laboratory situation.

Most of the statements and conclusions drawn from the information in Table 6 apply equally to Table 7. The principal changes are the result of a more complete means of classification which raises all of the percentages in directed classifications by lowering the percentage of



TABLE 7  
TEXTBOOK EMPHASES AS DERIVED FROM FACTOR ANALYSIS

Subject Area	Ind. Arts	Spec.	Both	Crafts	Non- Direct
Automobile Mechanics	4	0	0	0=	2
Art Metal	1	0	1	4	0
Ceramics	4	0	0	5	0
Drawing	5	10	2	0	3
Electricity	6	0	0	1	6 <sup>a</sup>
Foundry and Welding	1	3	2	0	0
General Crafts	1	0	0	6	0
General Shop	1	0	0	0	0
General References	2	2	0	0	1
Graphic Arts	8	2	1	2	1
Home Mechanics	1	1	0	2	0
Leathercraft	0	1	0	8	0
Machine Shop	0	4	0	0	1
Plastics	0	0	1	0	0
Sheet Metal	0	4	1	0	0
Woodworking	4	8	1	5	5 <sup>b</sup>
Totals	43	35	11	43	20
Percent of Total	28.3	23.0	7.2	28.3	13.2

<sup>a</sup>Special pattern - Laboratory-Theory.

<sup>b</sup>Combined Specialization-Crafts (3 books).

non-directed books. The specialization category is increased by about 7 percent, crafts by less than 3 percent, and industrial arts by about 4 percent.

Comparisons of Authors' Classifications  
with Factor-Analysis Classifications

Table 8 compares the classifications of use which authors have indicated and the findings through analysis and synthesis. The changes made in emphases are largely those from the non-directed category to one of the directed categories. These changes account for nearly 53 percent of all changes. This fact seems to indicate that at least half of the authors who did not state their purpose in writing did write with enough purpose to produce a pattern of content. It is also evident that as a classification tool content analysis places more books in use classifications than the statements of the authors.

The fact that six books classified by the authors as industrial arts textbooks have typical crafts or avocational patterns should be considered as significant. Since only thirty-seven books, by authors' statements, are intended for industrial use (see Table 6), a change of six books is a change of more than 16.0 percent. This is almost one-sixth of the books in this category. If the content criteria of this study are valid, this high discrepancy between classification by analysis and the authors' classification is evidence of poor judgment by authors for appropriate

TABLE 8

COMPARISON OF CHANGES IN CLASSIFICATION FROM AUTHORS'  
STATEMENTS TO FACTOR FINDINGS BY SUBJECT AREAS  
AND BY CLASSIFICATIONS OF USE

Changes in Classification	Changes in Subject Areas																	Total Changes, Use Class
	Automobile Mechanics	Art Metal	Ceramics	Drawing	Electricity	Forging and Welding	General Crafts	General Metals	General Comp. Shop	General Reference	Graphic Arts	Home Mechanics	Leather Craft	Machine Shop	Plastics	Sheet Metal	Woodworking	
Non-Directed to Ind. Arts	2	1	0	0	2	0	0	0	0	0	4	1	0	0	0	0	0	10
Non-Directed to Spec.	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	1	5	9
Non-Directed to Crafts	0	1	2	0	2	0	0	1	0	0	0	1	0	0	0	0	0	7
Non-Directed to I.A.-Spec.	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	3
Ind. Arts to Crafts	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	2	6
Crafts to Ind. Arts	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Ind. Arts to Spec.	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Spec. to Ind. Arts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crafts to Spec.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Ind.Arts to Non-Directed	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
Spec. to Non-Directed	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Crafts to Non-Directed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ind. Arts - Spec.-Non-Dir.	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Ind.Arts-Spec. to Ind.Arts	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Ind.Arts-Spec. to Spec.	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	
Ind.Arts to Ind.Arts-Spec.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Spec. to Ind.Arts-Spec.	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	3
Ind.Arts to Spec.-Crafts	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Crafts to Ind.Arts-Spec.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total Changes, Subjects	2	3	5	6	7	2	0	3	0	2	6	4	1	1	0	3	10	55

content. This means that one-sixth of the books may have been written without a clear idea of what industrial arts literature should contain. More specifically, these changes mean that one-sixth of the books claimed to be industrial arts in scope are written for purposes of simple activity or for avocational purposes. The logical validity and the predictive accuracy of the instrument of analysis used in this study is good circumstantial evidence of the reliability of the criteria when used to define industrial arts content. However, other studies must be made before proof can be claimed; therefore, all statements concerning comparisons between authors' statements and derived data must at present be considered as hypothetical.

Changes from the crafts category to the industrial arts category is evidence only of the inclusion of general education content, or the factors of general and technical information, occupational information, interpretive information, and consumer information. Inclusion of these factors in a crafts approach seems to indicate an effort by the author to make a complete and educationally sound approach to education.

Changes from industrial arts to specialization may be an indication of confused outlook, or it may indicate the closeness of industrial arts to specialization at senior high school levels. The changes in this case are in mech-

anical drawing which is taught at high school levels; therefore, no particular significance should be attached to the change.

Table 8 shows specialization to be a very stable category, since only three changes occur. These changes are to a combined industrial arts and specialization category, and should not be considered as a change but as an added application of the particular books due to content beyond that necessary for the stated purpose of the author.

Five books were reclassified as non-directed which had been classified for use by authors. Two were directed by their authors to both industrial arts and to specialization. Books directed to this combined emphasis are often centered upon subject matter "to be learned". Books with this approach are not usable as a textbook for industrial arts because they make no provision for achieving general education objectives. Three of the books treat the subject of electricity and contain a laboratory-theory pattern of content more nearly comparable with the experimental laboratory courses in the physical sciences. This approach is subject or theory centered and should be considered to be in a separate category.

### Subject Areas

Subject areas show varying degrees of stability when classified by factor analysis for use and compared with

authors' statements of use. These changes as shown in Table 8, are not easily interpreted.

The graph in Figure 5 shows the changes made when authors' statements are compared with the results of factoring to determine appropriate uses. The changes are expressed as percentages of the number of books in each subject area. It will be seen that home mechanics, with a 100 percent change, is the least stable of the subject areas; sheet metal is second with a 60 percent change; ceramics is a close third, et cetera. These changes appear to be very high. The explanation, however, is simple. In this presentation, changes from non-directed to directed categories are misleading because many of these changes are to be expected. Figure 6 has been corrected by removing the non-directed books and recalculating the percentages upon those remaining. It should be noted that the percentages are approximately cut in half and the number of subject areas making changes is reduced. Automobile mechanics and art metals show no changes in the corrected graph. The relative position of each subject is not altered, except for graphic arts, which moves from sixth position to tenth position.

Home mechanics may show instability because of the unsettled status of this course in the industrial arts curriculum. The number of books involved may also be a factor,



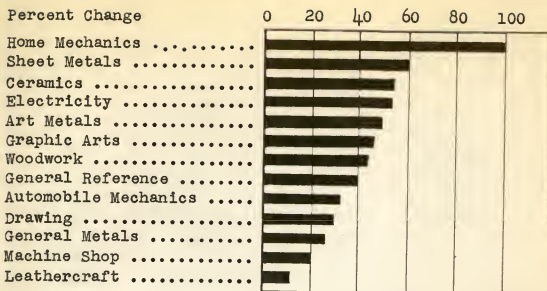


Fig. 5.--Stability of authors' statements of use when compared to factor patterns.

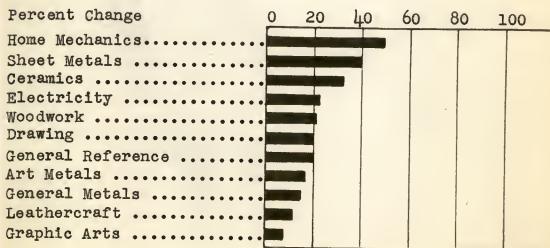


Fig. 6.--Stability of authors' statements of use when compared to factor patterns not including non-directed books.

because in very small samples one or two books may affect the category out of proportion to their real significance.

Sheet metal shows a high percentage of change, but other facts must be known in order to interpret this variance. The changes are from combined content patterns to a single content pattern and from single to combined patterns. The changes are not all changes in emphasis. One is a half change in emphasis because of a shortage of content for one-half of the combined pattern. The second is not a change at all but is based upon more than sufficient content for the authors' stated purposes. The percentage of change in emphases is insignificant when corrected for these errors.

In two of the three cases of change in ceramics the condition is similar to that of sheet metal. The changes are due to a superior treatment of subject matter and should not be considered as changes in emphasis. Corrections for this error would reduce the percentage by two-thirds, or to about 11.0 percent. Considering the small number of books in this area, this percentage of change should not be considered as highly significant.

Electricity should be considered as a special category. The way in which this subject is treated in the textbook does not make it comparable to other industrial arts subjects. The real significance that should be attached to changes in this area is that it has not been brought into

the same philosophic framework which is applied to other industrial arts subjects. Some of the books submitted for this area resemble textbooks for physics more than those for industrial arts.

Two of the changes in woodwork are from industrial arts emphasis to crafts. These changes may indicate either confused outlook, or a weak approach to industrial arts emphases. The one change from a combined area to specialization may be evidence of an effort to sell to two areas.

Drawing is one of the areas in which industrial arts and specialization may be almost identical. This change may be a failure to write for a validly defined industrial arts approach, or it may indicate a semi-specialization approach to subject matter.

The changes in general reference are not significant because of the small number of books and the nature of the materials. Both of the changes made do not constitute real changes, but they are changes to a more comprehensive category.

The one change in art metal is from industrial arts to crafts and is based upon insufficient related materials.

Both of the changes in general metals are from industrial arts to crafts and are made because of insufficient general education materials to justify the authors' statements of use. This type change is either the result of a

lack of understanding of the function of industrial arts by the author or a simple failure to do a good writing job.

The one change each in leather and graphic arts is due to a superior treatment and does not constitute a real change.

The most notable feature of the changes shown in Figure 6 and in Table 8 is the inconsequential nature of many of the changes. Nearly all of the changes become insignificant when all of the information is known. The above analyses are given to demonstrate the error involved in treating averages as significant. Averages are significant only for certain uses and must be interpreted according to the way in which they are obtained. This treatment also demonstrates the reliability of the factor-synthesis method of classification by comparisons with the stated purposes of the authors. In practically all cases the factor-synthesis method defines the uses which the author intended and places emphasis upon the strong features of the books. In some cases the system reveals weaknesses that the author does not mention. In all instances it seems that the factor method is a more objective tool for classifying books for use than either the author's statement or a subjective examination of the book.

Analyses of Textbooks Submitted by  
Individual Textbook Publishers

An examination of Table 9 reveals that a few publishers are able to influence the entire industrial arts field. By either analysis or authors' statements, three out of every four books found to contain industrial arts emphases are produced by five companies. This means that five editors are able to virtually control the materials presented for use in industrial arts in the schools. It should also be noted that Company A provided one out of five books with acceptable industrial arts content. Company E provided nearly one-fourth of the books which authors state are intended for industrial arts. By either measure of industrial arts emphasis, Companies A and B provided four-tenths of all books with industrial arts emphases. The facts cited seem to indicate that industrial arts is dependent upon very few sources for the majority of the textbooks which are found to be written for industrial arts purposes. The editors of these companies become very important because of the small number involved.

An examination of textbooks submitted by individual publishers gives an indication of the particular emphases of each company in books which they sell to schools and individuals for industrial arts uses. Tables number 10 and 11 summarize the emphases of publishers.

TABLE 9

PERCENTAGES OF BOOKS SUITABLE FOR INDUSTRIAL ARTS  
SUBMITTED BY EACH PUBLISHER

Pub- lisher	Analysis		Authors' Statements	
	No. Books	Per- centage	No. Books	Per- centage
A.....	11	20.4	9	19.1
B.....	7	13.0	7	14.9
C.....	0	00.0	0	00.0
D.....	5	9.25	5	10.65
E.....	10	18.5	11	23.42
F.....	8	14.8	5	10.65
G.....	4	7.4	2	4.25
H.....	4	7.4	3	6.4
I.....	2	3.7	2	4.25
J.....	2	3.7	2	4.25
K.....	1	1.85	1	2.13
Totals	54	100.00	47	100.00

Table 10 shows that thirty-nine books were submitted by one company. This number is 25.6 percent of all of the books examined. Company B submitted 18.4 percent of the books examined, and Companies C and D each submitted 11.2 percent of all books examined. Company E submitted 10.5 percent and Company F is represented by 9.9 percent of the total. The seven companies mentioned provided 86.8



TABLE 10

USE CATEGORIES OF TEXTBOOKS PUBLISHED BY INDIVIDUAL  
PUBLISHERS (SELECTED BY ANALYSIS OF CONTENT)

Pub- lisher	No. Bks.	Use Categories							
		Ind. Arts		Crafts		Spec.		Non-Direct.	
		No.	%	No.	%	No.	%	No.	%
A.....	39	11	23.2	13	33.3	10	25.6	7	17.9
B.....	28	7	25.0	6	21.4	12	42.9	3	10.7
C.....	17	0	00.0	16	94.1	1	5.9	0	00.0
D.....	17	5	29.4	9	53.0	5	17.6	0	00.0
E.....	16	10	62.4	2	12.5	3	18.8	2	12.5
F.....	15	8	53.4	0	00.0	8	53.4	1	6.7
G.....	10	4	40.0	1	10.0	4	40.0	1	10.0
H.....	5	4	80.0	1	20.0	0	00.0	0	00.0
I.....	2	2	100.0						
J.....	2	2	100.0						
K.....	1	1	100.0						
Totals	152	54		48		43		14	
% Totals		35.5		31.6		21.3		9.2	

percent of all of the books surveyed in this study. If Company H is included, eight companies provided nine out of every ten books included. These figures do not reflect actual conditions because it has not been determined what books are used in the field.

TABLE 11

USE CATEGORIES OF TEXTBOOKS PUBLISHED BY INDIVIDUAL  
PUBLISHERS (AUTHORS STATEMENTS OF USE)

Pub- lisher	No. Bks.	Use Categories							
		Ind. Arts		Crafts		Spec.		Non-Direct.	
		No.	%	No.	%	No.	%	No.	%
A.....	39	9	23.0	9	23.0	5	12.9	18	46.1
B.....	28	7	25.0	4	14.3	5	17.8	12	42.8
C.....	17	0	00.0	17	100.0	0	00.0	0	00.0
D.....	17	5	29.4	9	53.0	4	23.5	1	05.9
E.....	16	11	68.7	0	00.0	4	25.0	2	12.5
F.....	15	5	33.3	0	00.0	7	42.6	3	20.0
G.....	10	2	20.0	1	10.0	6	60.0	3	30.0
H.....	5	3	80.0	1	20.0	0	00.0	1	20.0
I.....	2	2	100.0						
J.....	2	2	100.0						
Totals	152	47		41		31		40	
% Totals		31.0		27.0		20.4		26.3	

The data available give some indication of the small number of editors who are able to exert a vital force within the field of industrial arts. If the individuals who edit textbooks for the publishing companies are cognizant of the nature and the needs of industrial arts, the books produced should reflect this understanding. If editors serve industrial education as a whole, their outlook or

philosophy may be that industrial arts is a "junior vocational program" and this philosophy may be reflected in their books. Information concerning the editors of the companies who edit industrial arts textbooks would give bases for inferences concerning the books used in industrial arts and the effects of the use of these books upon the field.

If only those books found suitable for industrial arts use by analysis are considered, (Table 9), seven companies account for more than nine out of each ten books surveyed. If the authors' statements are considered as the bases for selecting books for industrial arts use, (Table 10), six companies produce eighty-five percent of the books suitable for industrial arts use.

Several generalizations may also be drawn from Tables 10 and 11. Company A, by both authors' statements and by analysis, produces 23 percent of their books for industrial arts. Forty-six percent of the books produced by this company are not directed to a particular use by the authors. Authors classify 23 percent of the books for crafts and 12.9 percent for specialization. By analysis 33.3 percent of the books are placed in crafts and avocational categories, and 25.6 percent of the books are classified for specialization. In view of the differences in authors' statements of use and the uses found by analysis, this com-

pany seems to be promoting specialization and crafts books for industrial arts purposes. This practice may be an outgrowth of the shortage of good textbooks suitable for industrial arts use in some of the subject areas. The sale of specialization textbooks for semi-specialization at the senior high level is to be expected under present conditions and will influence the type of books promoted by the publishers.

The books provided by Company B show that this company makes an approach comparable to that of Company A. The major difference is that this company produces a larger proportion of specialization books and a smaller proportion of crafts books. Only one-fourth of the books printed by this company are for industrial arts use.

One major fact can be derived from the data for Company C. This company specializes in crafts and avocational books and should not be considered as an industrial arts publisher under the criteria of this study.

Comparison of Table 10 and 11 shows that authors' statements concerning use and findings by analysis for books provided by Company D are practically identical. Only one book is found to vary, and this variance is from unclassified to specialization use. This consistency seems to indicate cognizance of the different qualities of content for various approaches. This company provided a high pro-

portion of crafts books. Over one-half of the books were classified in this use category by both authors and analysis. Slightly more than 29 percent of the books were classified for industrial arts use.

Company E shows a tendency to specialize in industrial arts textbooks. By authors' statements 68.7 percent of the books provided for this study are written for industrial arts use. By analysis 62.4 percent of the books are found to fit industrial arts patterns. It should be noted that this company does not produce crafts books by authors' statements. Two books are classified as crafts by content-pattern analysis.

Company F does not produce crafts books and shows a clear tendency toward classifying books for use. Only three books, or 20 percent of the books submitted by this company, are not directed to a specific category of use. One of these is a workbook, one is for general reference, and the third is a drawing text. By analysis several of the books were found to fit into categories of both industrial arts and specialization. This accounts for the seeming differences in the total number of books in the two tables. This company seems to place approximately equal emphasis upon industrial arts and industrial-vocational education textbooks. Inclusion of specialization books for industrial arts use may be considered as a lack of differentiation between the two areas by the publisher,

of it may be evidence of the necessity of using specialization texts for senior high school unit shops.

Only two authors of books provided by Company G state that they write for industrial arts uses. Six books are directed by authors for use in specialization, and one author directs his book to crafts purposes. By analysis four books were found to be usable for industrial arts and four books were found usable for specialization. This particular company makes no differentiation between books for industrial arts and industrial-vocational education. It is on the basis of inclusion of sufficient materials that four books are found to be usable for industrial arts. These books are for unit shop use, but they contain general education content.

Company H is one of the better known companies supplying many books for industrial education. The five books submitted seem to be a small representation of the books handled by this firm. The fact that four of the five books fit the specifications for industrial arts use reveals that considerable care was made in selecting textbooks for industrial arts education. The fact that this company has nearly one hundred books listed for subjects which are often dealt with as industrial arts seems to indicate an unwillingness to select books which might not be considered as usable in industrial arts. The president of this company makes the



following statement: "We have a great many books which are being used successfully in industrial arts courses, produced at varying times with variations in philosophy, aims and objectives. Out of the lot, however, we have selected five books to send to you, as being the nearest to what you have in mind."

Companies I and J submitted only two books each. One of the two in a letter states: "I am sending you separately today our two most recent publications in the industrial arts field.... These books are the first in a new series.... Really these are the only active industrial arts publications on our list."

The second company states: "These, [two textbooks] frankly, are the only books we classify as 'Industrial Arts'."

Company K is represented by only one book. This book was secured from the Education Library, University of Florida, and was not sent by a publisher; therefore, generalizations about this company should not be attempted.

The composite trend by companies is obscured by the variable approaches and emphases of the companies. The recently copyrighted books seem to show an emphasis in general education content. The previously cited reference from a letter announcing the beginning of new "Industrial Arts Series" also seems to indicate a new emphasis for industrial arts by at least one publisher. The fact that

only one-third of the books submitted were found usable for industrial arts as textbooks seems to show that the publishers are only in the beginning of a trend toward a new approach to industrial arts textbooks. The over-all trend seems to be one of transition from the classification of any technical book for industrial arts uses to a more careful selection of books designed for industrial arts use only.

#### Problems of Textbook Authorship

The quality of the textbook depends upon the individuals who cooperate in its production. The teacher and his students take many of their cues from the textbook. If the textbook provides the proper cues, the purposes of industrial arts will be served. If poor direction is given, the outcome is not predictable and the program will suffer. The majority of the textbooks which are written specifically for industrial arts use have acceptable content. Some of these books, however, have disqualifying elements that make the text unusable for classroom use.

Two types of errors occur in textbooks which should be considered as disqualifications for use. These are errors in information and errors in approach. Both types of error create doubts as to the authority and scholarship of the author.

The error in information may be illustrated by the following case. A well known author has included in his discussion of brakes a statement that hydraulic brake lines are made of copper tubing. It is possible that this misinformation could lead to a serious accident in the event some student made a repair to the brakes in his automobile with copper tubing. Manufacturers are required to use seamless steel tubing for this purpose because copper is soft and easily damaged.

A second illustration may be either an error of judgment or one of information. This author gives instructions for "jointing" the circular saw by using a stone. This in itself is not necessarily an error; but, when he instructs the operator to leave one-half inch of the saw exposed, he makes a serious departure from safe practice. No word of warning is included in the statement. When the nature of the experimenting adolescent is considered in relation to the instructions given, this one lapse in judgment should disqualify the book for use in any class.

The error in approach may not have immediate results but in the long view may be equally as dangerous. Probably the most frequent error of this type is the backhand approach to operational procedures. This approach is negative rather than positive. Ways of being out of danger when operating a machine are stressed rather than the ways of

operating the machine without accident. The fact that accidents are sure to happen is tempered with the advice to avoid personal injury.

A second form in which this approach is made is illustrated by the careless author. This author states that a "push stick" should be used in jointing stock less than twelve inches in length. The first error in this statement is in making a blanket rule. The second error is in assuming that stock can be controlled on the jointer with a "push stick." The error is magnified by referring the student to an illustration in which the operator is "facing" a piece of stock using a "shoe". If the nomenclature is understood (terms were not defined) the student is invited to engage in a questionable practice. If the student interprets the "shoe" in the illustration to be a "push stick," he will also interpret "facing" to be "jointing". In this event he will be considerably confused in both practice and nomenclature.

The "watered down approach" is a different error but the error in the preceding illustration is an outgrowth of this fallacy. The deliberate weakening of technical and operational materials by wordiness and by generality rather than specificity defeats the purposes of industrial arts. Industrial arts is by its nature a technical subject. To treat such subject matter in general terms changes its nature

and cannot provide "orientation to technology". To look at a forest from a distance does not give a concrete idea of the nature of trees in general, and even less the nature of a particular kind of tree. In industrial arts the same danger is inherent in taking a viewpoint too general in outlook. Even junior high school students understand technical terms and technical usage if the meanings are explained in understandable terms. Generality and specificity have little to do with understanding these terms; in fact, specific terms are more meaningful if concepts are developed through definition and explanation of new terms and principles. A disservice is done to both industrial arts and to youth by dilution through generality. The dilution should be in terms of the amount of materials covered and by the inclusion of explanation of terms and never by general treatment of technical subject matter. Technology and science are closely related. General treatment betrays the intent of both.

#### The Professional Textbook Writer

In industrial arts there is some tendency toward professional bookwriting. One or more writers will produce textbooks in many fields, and occasionally several textbooks will be written in one year. This practice cannot be productive of the best in textbooks because scholarship must necessarily be slighted. Very few authors write

equally well on all subjects. When books are produced in various areas within short periods of time the author may be suspected of poor scholarship or of lending his name to books produced by others. The authority of the over-prolific writer is questionable, because the experiences for dealing in all subjects of industrial arts would require more than one lifetime.

Professional writers produce books which are not derived from first-hand experiences. The writer in a particular subject area should have experience in the industrial applications of that area if he attempts to interpret the area in terms of experience and authority. Teacher education can make little claim for providing the activities that occur in industry. Observation and vicarious experiences can seldom supply the necessary insight for producing an authoritative textbook.

In some of the older and more entrenched subject matter areas there is a trend toward an inbreeding of authority. Authors use the same references in preparing their books, and the result is often books with practically identical subject matter. The process when continued becomes restrictive in the sense that each "new" book uses "authority" from the generalized original sources. Under these circumstances the "new" book bears a recent copy-right for old materials. This practice raises the problem



of ethics, since textbooks with more recent copyright dates will usually be selected over older books if the materials contained are practically the same. This feature is easily recognized in some of the woodworking and mechanical drawing textbooks.

### Significance of the Author's Preface

The author's preface serves the same purpose as the directions for a doctor's prescription. The author who does not give directions for use seriously handicaps the user and restricts the use of the book. Books without direction are often poor textbooks. The author who will not state his purpose in writing is usually suspected of being afraid to commit himself for some reason, or of writing for commercial reasons. The author who does not make this commitment is asking the customer to buy a "pig in a poke", or to guess at the materials and their reliability for his purposes. The preface bears the same relationship to the textbook that norms, reliability coefficients, and validity coefficients bear to standardized tests. The absence of the author's preface should provide an adequate warning of "buyer beware".

### Analyses of Textbook Emphases in Subject Areas

The data which has been presented serve to show the general conditions related to the emphases in industrial

arts textbooks. The fallacy of averages has been demonstrated in order to show the necessity for making an analysis of each subject area grouping of texts to determine the real status of the textbook situation. This analysis will contain two viewpoints. One viewpoint is that the use of all books presented is desirable, either as textbooks, or as supplementary books. This viewpoint considers the total sample and shows how the textbook situation may be dealt with by using books written for other uses as supplements which may be made in the name of "expediency". The use of "stop-gap" measures can be put on an intelligent basis if the situation is understood and the proper approach is made to the selection of materials. The use of these materials should be considered temporary, however, and should be used only until sufficient and suitable materials have been prepared.

The second viewpoint is concerned with only those textbooks found to be suitable through factor analysis. Consideration of only these books gives a true picture of actual conditions in the industrial arts textbook field without supplementation from outside sources. Previous discussions have shown that only one-third of the books submitted are suitable for industrial arts use as textbooks.

Only content factors and the use categories will be presented in the summary tables for each subject area. If

information concerning objectives is desired, this information may be obtained from the annotation found in Appendix A. The symbols and the contents represented by each symbol are defined in Chapter IV. The names and symbols used for content factors are given in Table 12 as a matter of convenience to the reader.

TABLE 12  
TABLE OF SYMBOLS AND FACTORS USED FOR CONTENT

Symbol	Factor	Symbol	Factor
1 - Tool Description		8 - Consumer Information	
2 - Operations and Procedures		9 - Interpretive Information	
3 - Material description		10 - Occupational Information	
4 - Projects		11 - Safety Information	
5 - General Information		12 - Specialization Emphases	
6 - Technical Information		13 - Avocational Emphases	
7 - Design and Plan Information		14 - Values and Attitudinal Information	

By pattern analysis forty-nine books were picked from the total group as meeting the requirements for industrial arts use upon the basis of sufficient general education content to satisfy the definitive criteria of this study, i.e., to establish definite patterns of industrial arts content. This selection eliminated project books and

general references. Of the books selected nineteen were not directed to industrial arts use by the authors. Of these nineteen, five were directed to other uses. The remaining fourteen books were directed to no specific use. Table 13 shows these facts in table form and in terms of percentages of the forty-nine books.

TABLE 13  
PERCENTAGES OF BOOKS DIRECTED BY AUTHORS TO USES

	No.	Percent
Books Directed to Industrial Arts	30	61.2
Not Directed to Any Particular Use	14	28.6
Directed to Crafts or Avocational Use	3	6.1
Directed to Industrial-Vocational Use	2	4.1
Totals	49	100.0

Under the assumption that it is desirable to use books that are suitable to industrial arts as defined by the criteria of this study, Table 14 has been prepared to show the status of textbooks meeting the criteria in terms of the number of books in each subject area and in terms of the total number of books presented.

Table 14 shows that forty-nine books were found suitable for use in industrial arts subject by the factor-

TABLE 14

TEXTBOOKS IN EACH SUBJECT AREA FOUND SUITABLE FOR USE  
IN INDUSTRIAL ARTS BY FACTOR ANALYSIS

Subject Areas	No. Bks.	% Total Suited	% Subj. Area	% Total Sample
General Shop	1	2.04	100.0	0.66
Woodworking, General	4	8.17	37.6	2.63
Woodworking, Machine	1	2.04	16.6	0.66
Drawing, General	7	14.30	16.6	4.60
Metals, General and Bench	5	10.20	41.7	3.30
Metals, Sheet	1	2.04	20.0	0.66
Metals, Art	1	2.04	16.6	0.66
Metals, Welding, Foundry, Forging	3	6.12	50.0	1.97
Metals, Machine Shop	1	2.04	16.6	0.66
Graphic Arts	8	16.32	61.5	5.26
Electricity	6	12.24	46.2	3.94
Handcrafts, General	0	0.00	0.0	0.00
Handcrafts, Textiles	1	2.04	100.0	0.66
Handcrafts, Leathercraft	0	0.00	0.0	0.00
Plastics	1	2.04	16.6	0.66
Photography	1	2.04	100.0	0.66
Ceramics	4	8.17	44.5	2.67
Home Mechanics	1	2.04	25.0	0.66
Automobile Mechanics	3	6.12	50.0	1.97
Totals	49	100.00		32.28

analysis method. This number is 32.28 percent of the number of books examined in this study. The discrepancy between this table and Table 7 is due to counting multi-purpose books as industrial arts when industrial arts content is sufficient for this use. The discrepancy between this table and Tables 9 and 10 is due to inclusion of textbooks only in this table, while all books are included in Tables 9 and 10. Other pertinent generalizations may be developed by an analysis of each subject area. These findings will be given under subject area headings.

#### General Shop

The course most often reported in the Biennial Survey<sup>1</sup> is general shop, which accounts for more than 30 percent of the total offering in industrial arts. Ordinarily one would expect to find many textbooks prepared for this area because of the popularity of the offering. An examination of Figure 1 shows that this is not a valid assumption. The number of books correlates very poorly with the need. Indeed, the only text examined was not submitted by a major industrial arts publisher, but was procured for the purpose of examining at least one approach to this problem. Less than one percent of the books examined were prepared for use in the general comprehensive shop. The problem of meeting this need evidently is being met through the use of multiple textbooks or through the use of teacher-made syllabi. This

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<sup>1</sup>U. S. Office of Education, op. cit., pp. 35.



problem should be explored in another study, since it is outside the scope of the present undertaking.

It must be assumed from the evidence in this study that the need for general shop textbooks has not been met.

TABLE 15

## SUMMARY: GENERAL COMPREHENSIVE SHOP

Bk.															Content Factors (symbols)	
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern	
1	(X)	(X)	(X)	X	X	(X)	(X)			(X)	X				(Ind.Arts)	

The one book examined contains materials for drawing, woodwork, metalwork, electricity, and plastics. The problem of avoiding a superficial approach to industrial arts for orientational purposes has not been solved in this text. There seems to be an impasse in industrial arts concerning this crucial issue of covering a broad area and, at the same time, of maintaining perspective. There is a real need for orientation; but research should be undertaken to discover whether orientation is best achieved through a light and shallow approach to a large number of subject areas or whether it is best achieved by more penetrative studies in less diverse fields.

At best, it must be concluded that general comprehensive shop textbooks are needed and that they are in short

supply.

### Woodworking

Woodworking has always been one of the most popular of all courses offered in the area of industrial arts. The Biennial Survey, United States Office of Education<sup>1</sup> shows that woodwork courses constitute 23.6 percent of the total offering in industrial arts. This popularity is also reflected by the numbers of woodworking textbooks submitted for this study. Woodworking textbooks constitute 15.1 percent of the total sample. Table 16 summarizes the content and the use patterns of woodworking textbooks. Fifteen textbooks submitted are classified as general woodworking. This classification does not constitute a uniform treatment of woodworking, but, the books are classed as "general" upon bases of general handtool operations, general machine operations, and because the books do not treat a specific phase of woodworking such as "cabinet making," "mill work," or "machine woodworking." Six textbooks are classified as machine woodworking. Two books are primarily project books. Each of two books in machine woodworking treats one particular machine, and one book contains materials for two related machines. These three books are the first of a series of books which are being published to cover the machine woodworking field. One book on the subject of pocket knife whittling was classed as arts and crafts be-

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<sup>1</sup>U. S. Office of Education, op. cit., pl 35.

cause the book bears little or no relationship to woodworking as an industry.

### General Woodworking

The fifteen books in general woodworking have several characteristics in common. All of the books describe tools and operations. All books describe operations and procedures. Material descriptions are not found in two of the fifteen books. Projects are not given in four books, three books have very little related information. All books include technical information. Less than half of the books contain planning and designing materials. Consumer information, except that which may be implied from general knowledge of materials and construction methods, is conspicuously missing from woodworking textbooks. Three books contain very weak treatments of this factor. Three books contain interpretive information, three books have occupational information, seven books have safety information, one book weakly emphasizes specialization, and four books include materials conducive to personal development.

Four textbooks may be said to be strong in industrial arts content for general education. Each of the four books has at least one failure to meet all factors of content either by omission or by weak treatment. The one book treating only related information, if used for the purpose for

TABLE 16

## SUMMARY: WOODWORKING

Bk.	Content Factors (symbols)														14 Use Pattern
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1.	X*	X*	X*	X*	X*	X*	X			X	X			X*	X* Ind.Arts
2.	X	X	X	X	X*	X	X	X	X	X	X			X*	Ind.Arts
3.	X	X	X*	X	X*	X	X	(X)	X	X	X			X	Ind.Arts
4.	(X)		X		X*(X)	X*	X*	X*	X*	X*	X*			X*	Ind.Arts
5.	X	X	X	X	X	X	X*	X*			X			X*	Crafts
6.	X*	X*	X*	X	X	X*	X				X				Spec.
7.	X	X	X*	X*	X*(X)	(X)		(X)			X			X	Crafts
8.	X	X	X	X	X	(X)					X			X	Crafts
9.	X	X	X*		X	X*						(X)			Spec.
10.	X*	X*	X*	X		X									Spec.
11.	X	X*			X	X	X								(Spec.)
12.	(X)	X	(X)	X	X	(X)									Crafts
13.	X	X*			X	X*									Spec.
14.	X	X	(X)	X		(X)				X					Crafts
15.	X*	X*				X									Spec.

## MACHINE WOODWORKING

1.	X*	X*		X	X*				X*	X*					Spec.
2.	X*	X*		X	X*				X*					X	Spec.
3.	X*	X*		X	X*				X						Spec.
4.	X	X	(X)	X	(X)	X*	Lathe only				X	(X)	X		Crafts & Spec.
5.	X	X	(X)	X	(X)	X*	Circ. Saw				X	(X)	X		Crafts & Spec.
6.	X	X	(X)	X	(X)	X*	Band Saw				X	(X)	X		Crafts & Spec.

## Project and Procedures

7.	X		X*	X	(X)	X
8.	X		(X)	(X)		

which it is designed, serves to fill these gaps in content. It should be pointed out that the use of this treatment with any one of several books submitted results in complete indus-

trial arts content. The danger in such a procedure is the likelihood that teachers may follow one text and neglect the other, particularly if the teacher tends to be weak in unit organization. By using two textbooks it is possible to provide all factors with strength. From this fact it is safe to conclude that the field of general woodworking is adequately provided for. This is not to imply that a comprehensive text is not desirable in this area. In general woodworking, textbooks tend to be either shallow in content or to omit the general education approach. A comprehensive text must contain more material than any text examined and must be well written if it is to compete successfully with the texts already on the market. The comprehensive and well balanced textbook has not been yet produced for this area, but by selection it is possible to do a good job in teaching woodworking with industrial arts emphases.

Six of the woodworking textbooks submitted are textbooks for specialization purposes. They may be recognized by the characteristic strengths in technical information, operations and procedures, and by omissions in projects, consumer information, interpretive information, and occupational information. This pattern of emphasis builds the learning situation around tools and operations and slights the individual in the learning situation.

These textbooks are not easily used in a general education approach because of their emphases for different purposes. The teacher who is not inherently strong in philosophy and method will find his educational product to be "junior vocational" in character if he uses these textbooks.

Two approaches to subject matter appear in the textbooks studied. Textbooks usually contain informational and operational units. The techniques vary: some of the books are written with operations and related tools as the center of instruction; others are organized around specific operations and individual tools. It is particularly significant that the subject matter in specialization textbooks is based upon analysis and is presented in a logical order, which is arranged by tool or operational families and related units.

The second approach is the graded-project-centered organization used in books written for crafts and self-instruction purposes. Two of the fifteen books examined fall into this category. The graded-project-centered technique is a psychological approach relating instruction to the needs of the learner to perform increasingly difficult tasks.

### Machine Woodworking

Six textbooks were submitted for machine woodworking. The general pattern for the machine woodworking text



differs from that presented by the general woodworking text. This may be accounted for by the fact that, in general practice, machine woodworking is taught as a unit shop. Only three authors are represented.

Two authors did not include material descriptions or projects. None of the books contain materials for planning, consumer information, interpretive information, or occupational information.

The stress in machine woodworking is upon machines, operations and procedures, general information, and technical information. Safety is stressed by all books, and four books have a degree of specialization emphasis. One book stresses specialization rather strongly but it is also one of the two books strong in general education content. Each book is machine and operation centered. The number of machines to be covered makes it impossible to make a thorough coverage in one book of all machines and, at the same time, to include the necessary related materials for a comprehensive industrial arts approach. It is generally assumed that students working in this area have explored the field in a general woodworking course and are enrolled in the course because of previously discovered interests. The planning and selection of projects and materials as well as interpretive and consumer information should have been studied previously; therefore, inclusion

of these materials in machine woodworking might be considered as duplication. It seems, in the light of the foregoing statement, that the textbooks examined may be considered as an entirely adequate treatment of this phase of woodworking.

Supplementation.--In instances requiring a complete treatment in this area it is suggested that The Students Planning Book<sup>1</sup> be used as a supplement for planning, that Materials and Processes<sup>2</sup> be used to provide material descriptions, and that Suggested Related Information for the Woods Area<sup>3</sup> be used for filling in the other gaps for general education. A second alternative is to select general woodworking textbooks to supplement machine woodworking texts. Textbooks which supply strong emphasis in the omitted areas should be selected. It should also be mentioned that two books with projects and procedures were submitted which may be used for supplementary projects.

<sup>1</sup>Gerald B. Basinger and G. Harold Silvius, The Students Planning Book, Industrial Arts and Vocational Classes, Scranton: International Textbook Co., 1941, 1943, 1950.

<sup>2</sup>Max Kohn and M. J. Starfield, Materials and Processes, New York: The Macmillan Co., 1952.

<sup>3</sup>The State Education Department of New York, Suggested Related Information for the Woods Area, Albany: Delmar Publishers, Inc., 1950.

### Mechanical Drawing

Thirteen books were submitted in the area of mechanical drawing which are classified as textbooks for general drawing. The offerings in this field show considerable uniformity of content. The major differences are found in the comprehensiveness of coverage. All of the books, with the exception of one which develops only orthographic projection and isometric techniques, cover the general area. Particularly significant is the lack of specialization books for architecture, sheet metal, or machine drawing. Table 17 shows the factors of content and the suggested uses of the drawing textbooks examined in this study.

Ten textbooks are fairly strong in content for general education. Some weaknesses are present but they are minor. Two texts are outstanding in general education content and seven books show good content for this purpose. With this number of textbooks showing strength, it is safe to conclude that the textbook provision for drawing is sufficiently well made.

There are certain factors which are either omitted or dealt with very lightly. Five books have little or no materials for planning. Five books deal with consumer uses of drawing. Six books are strong in interpretive information. Three of those are outstanding in this factor. Five

TABLE 17  
SUMMARY: MECHANICAL DRAWING

Bk. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
Content Factors (symbols)															
1.	X*	X*	X*	X	X*	X*	X*	X*	X*	X*		X	X	X	Ind.Arts- Spec.
2.	X*	X*	X	X*	X*	X*	X*	X*	X*	(X)				X*	Ind. Arts
3.	X	X	X	X	X	X	X	X	X	X*				X	Ind. Arts
4.	X	X	(X)	X*	X*	X*	X*	X	X	X*				(X)	Ind. Arts
5.	(X)	X*	X	X*	X*	X	X	X	X	(X)					Ind. Arts
6.	X*	X*	X	X*	X	X*	X		(X)			X			Spec. & (I.A.)
7.	X	X*	X	X	X*	X*	X	(X)	(X)			X			Spec.
8.	X*	X*	X	X	X	X*	X		(X)			(X)			Spec.
9.	X*	X*	X	X	X	X*		(X)	(X)			(X)			Spec.
10.	X	X	(X)	X	X*	(X)		(X)	X	(X)					(Ind. Arts)
11.	X	X	X	X	X	X									(Spec.)
12.		X		X	X	(X)									(Spec.)
13.	(X)	(X)		X		(X)									No Pattern

## Workbook

14. X

## Blue Print Reading and Sketching

15.	X*	X	X*	X	X*		X	X*							Spec.
16.	X*		X	X	X*		X	X	X						Spec.
17.			X		X										No Pattern

## Reference (Perspective)

18.			X	X	X		X*				X	X			Theory
-----	--	--	---	---	---	--	----	--	--	--	---	---	--	--	--------

other texts make some attempt at interpretive treatments.

Only two texts have strong treatments of occupational information. One text emphasizes the avocational uses of drawing. Three texts deal with values and attitudes acceptably well. It is significant that the removal of four books materially

alters the overall picture. These four books contain the majority of the less frequent factors and also show strength in nearly all of the factors which they do contain.

It is interesting to note that general education content in drawing books is not new. Copyright dates for the four texts listed above are 1930, 1938, 1945 and 1950. The book copyrighted in 1930 was revised in 1935, and the text first copyrighted in 1938 was revised in 1949. In the literature on textbook selection generalizations are found to the effect that books reflect the thinking of the period of their first copyright date. If this generalization is true, the beginning of general education emphases by drawing textbook authors dates back at least twenty years.

### Workbooks

The use of workbooks in industrial arts drawing is illustrated by two books. These books contain projects and cannot be used as textbooks without the references given in the workbook. The teacher should be aware of the existence of this type of aid for teaching drawing. Its chief value lies in the time saved in layout of drawing sheets and in the added time which may be used in learning fundamental operations.

### Blue Print Reading and Sketching

Three textbooks were submitted for blueprint read-

ing. Two included sketching practice. The third deals entirely with interpreting blueprints. These materials are recommended for use as supplementary materials for drawing or may be used as supplements in metalwork or other unit courses where texts have weak or no treatments of drawing and the interpretation of drawings. A second use which these materials may serve is to teach the fundamentals of visualization and description of objects. This may be considered a makeshift arrangement, but the fundamentals of shape description may be taught rapidly and without drawing equipment by using these books.

It should be noted that the blueprint reading and sketching approach to teaching shape-description stresses two factors in particular. Operations and procedures and technical information are generally given major emphasis, while general information, interpretive information, and occupational information receive little or no emphasis.

#### Reference

One reference was submitted. The reference deals with perspective and is written for the artist and the architect. The book is easily understood and is recommended for use in architectural drawing at the college or high school level if perspective is taught.



## Metalwork

Metalwork is a composite of several specialized trades. It is not possible to treat the whole composite as a single subject area because of the variety of treatments. Art metal has been classified as a craft subject, although it might be considered as more related to metalwork. If art metal is not included, the textbooks in the area number twenty-nine. If the six books for art metals

TABLE 18

## SUMMARY: GENERAL AND BENCH METALS

Bk.	Content Factors (symbols)														Use	Pattern
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
1.	X*(X)	X*			X* X	X X	X	X*	X*	X*				X*	Ind. Arts	
2.	X	X	X	X	X X	X X	X X	X (X)	XX				(X) X	X	Ind. Arts	
3.	(X)		X		X*(X)	X* X*	X*			X				X	Ind. Arts	
4.	X* X*				Reference, Hand Tools											Reference
Bench Metals																
5.	X	X	X		X* X	X*(X)	X (X)		X					X	Ind. Arts	
6.	(X)	X	X	X	X* X	(X)				X					Crafts	
7.	(X)	X	X	X	X (X)	(X)		(X) (X)	(X)						Ind. Arts	
8.	X	X	(X)	X	X (X)	X				X					Crafts	
9.	X*	X*			(X)	X* X				X					Spec.	
10.	X	X	X	X	X X										Crafts	
11.	X	X	X		X X					X					Crafts	
12.	X	X	X	X	X (X)										Crafts	
Projects Book																
13.				X	(referenced to textbooks)											

are added there are thirty-five. These numbers represent respectively 19.2 percent and 23.0 percent of the total number

of books submitted. Metalwork, as offered in the high schools, represents 11.2 percent of the total offering in industrial arts. Table 18 summarizes the factors and uses of both general metals and those prepared for bench metals.

### General Metals

Four books dealing with general metals were submitted. Two are comprehensive textbooks dealing with hand and machine operations, a third book treats related information, and a fourth book treats hand tools and their uses. The last mentioned book is suitable for reference purposes only, but it serves this purpose well. One of the general comprehensive texts does not contain projects, but, other than this one omission, contains a complete complement of industrial arts factors. Used in conjunction with book number 3, which treats related information, either of the two should prove satisfactory for a general metals course. The first book has a weakness which should be noted; procedures are not strongly treated and supplementation should be made for this weakness. General metals textbooks examined are adequate, although improvement in over-all coverage by a single text is possible and desirable.

### Bench Metals

Eight textbooks are included in the bench metals classification. One referenced project book is included

in the group which cannot be considered as a textbook. The textbooks treating related information which have been discussed as general metals, are also applicable to bench metals. These texts will not be discussed in bench metals except to point out that these references may be used as supplements to fill in the existing gaps.

The texts examined present the following common characteristics. Five have a full complement of manipulative factors. Two of the remaining books have no projects and the third has neither projects nor material descriptions. All have general technical information. Three show weaknesses in technical content, and only one shows strength. Five have materials for planning; but only one shows strength in this factor, and three are weak. Consumer values are included in only one textbook. Interpretive information is found in two books, but only one of them adequately treats this factor. Occupational information is found in two texts, but not to an acceptable degree. Two books fail to stress safety. One text makes values and attitudinal commitments. One of the textbooks is designed for specialization purposes but does not refer to this emphasis. Its character is noted by strength in tool descriptions, operations and procedures, and technical information. The omission of material descriptions, together with weak general information, also tends to show the

orientation of this book toward specialization. The books classified for bench metals tend to be weak in general education content. This weakness is found to be a characteristic of technical treatments and may be stated as a generalization -- textbooks treating highly technical subject matter areas tend to neglect general educational values.

Since only two textbooks contain industrial arts emphases for general education, there is a need for textbooks of the comprehensive type for this particular area. By using the textbook dealing with related information discussed in general metals, it is possible to organize materials for an adequate industrial arts treatment. However, the specific texts prepared for this area are not adequate if used alone.

### Machine Shop

Five textbooks in the machine shop area are included in this study. One of these is comprehensive in approach, covering grinding, drilling, lathe work, shaper work, milling machine work, and power hack sawing. Two cover lathe work and related operations used by the lathe operator. One is a series textbook and constitutes only one part of a six-book series which covers the machines and operations generally carried on in a machine shop. While only one in the series was submitted by the publisher, the general pattern is indicated and it can be assumed that with the

related books of the series a complete coverage of machines would be obtained. This series is not designed for industrial arts but is specialized in emphasis. This does not necessarily disqualify the series for industrial arts use, but it does make careful supplementation and careful organization of class procedures necessary if general education content is desired.

Table 19 shows that the textbooks in this area have the common characteristics of all technical textbooks; emphases are upon operational skills and the general and technical knowledge connected with these skills. All general educational factors are neglected, making extensive supplementation necessary. The two books previously discussed in general metals are also suitable for supplementing this area.

There is not a clearly defined need for extensive general education content in machine shop courses because these courses are nearly always elective following some type of orientational course. Under this provision the textbooks examined will provide an adequate basis for the machine shop area.

### Sheet Metal

Sheet metal is generally included in bench metals and is not generally taught as an individual subject for

TABLE 19  
SUMMARY: MACHINE SHOP

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
1.	X*(X)	X*			X*	X	X	X	X*	X*	X*			X*	Ind.Arts
2.	X*	X*	X	X	X	X*					X				Spec.
3.	X*	X*	(X)			X*					X	X			Spec.
4.	X*	X*				X*					X	X			Spec.
5.	X*	X*		(X)		X*					X				Spec.
Project Book															
6.					X*										

orientational purposes. Whenever sheet metal is taught as a separate course, it generally follows an orientational course which makes many of the general education factors unnecessary. If sheet metal is taught as a first course, the general education factors should be included.

Five books represent this area. The factors of content are summarized in Table 20. All of these texts are strong in specialization factors and none are strong in orientation or general education factors. All except one are weak in design and plan information. None of the books emphasize consumer values. One has a satisfactory degree of interpretive information and also contains consumer infor-



mation. All of them emphasize safety, and one has specialization emphasis. Two of the books in this section are part of a series developed for industrial-vocational education. The complete series constitutes a course of study which is comprehensive in scope. The series includes books on layout, mathematics, job sheets, machine processes, and hand processes. Only the books treating hand processes and machine processes are included in this study. Two other books were also written for specialization, and the remaining book has practically the same content. Book number 1 may have been written specifically for industrial arts but the treatment of subject matter is shallow. It is doubtful whether this is a desirable feature for semi-specialized course work, since the orientation desired at this level is achieved only by a more penetrative study.

TABLE 20

## SUMMARY: SHEET METAL

Bk. No.	1	2	3	4	5	Content Factors (symbols)								14	Use Pattern
1.	X*	X*	X*(X)	X	X*(X)			X	X	X*	X*				Ind.Arts & Spec.
2.	X	X*	X*	X	X	X*(X)					X	(X)			Spec.
3.	X	X	X	X	X	X	X	(X)		X					(Spec.)
4.	X*	X*			(X)	X*(X)				X					Spec.
5.	X*	X*			(X)	X*(X)				X					Spec.

Note: No. 4 and No. 5 are a series presentation and must be used together.

If it is assumed that sheet metal taught as a unit-shop course should orientate to technology through semi-specialization, the books discussed constitute an adequate treatment. If, however, the theory is held that all industrial arts courses must contain the general education factors, the books submitted are not adequate, and books should be prepared containing these factors.

### Hot Metals

The subjects of welding, forging, and foundry, are closely related and are treated as a group. Table 21 summarizes the content of the books in these areas. Welding may be taught in general metals or it may be taught as a unit course. As a unit course it is specialized or semi-specialized in content. If it is taught as an industrial arts course, it should be very similar to a vocational course except for the purpose in teaching and learning the content and skills involved. The textbooks will be interchangeable except that vocational work will devote more time to practice and will spend less time with orientational factors. The difference is in degree and not in kind.

### Welding

Four welding textbooks are included in this study. All are similar in factor content. One book does not have projects. All contain little or no planning and design

TABLE 21  
SUMMARY: HOT METALS

Bk. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
Content Factors (symbols)															
Foundry and Pattern making															
1.	X*	X*			X	X*	(X)	(X)	X		X*	X			Ind.Arts & Spec. (Ind.Arts)
2.	X	X	X	X	X	X	(X)	(X)	(X)	(X)	X				
Forging															
3.	X	X	X	X	X	X	(X)		(X)		X				(Ind.Arts) & (Spec.)
Welding															
1.	X	X	X	X	X	X	(X)		(X)		X				(Ind.Arts) & (Spec.)
2.	X	X**X			X	X					X	X			Spec.
3.	X	X	X	X*	X	X					X				(Spec.)
4.	X	X*	X*	X	X	(X)			(X)	(X)	X	X			Spec.

information. Only one has occupational information. Two books have specialization emphases. All other pertinent factors are present in all these books in acceptable proportions. The theory of the function of the unit shop determines adequacy in this as in other unit type organizations. The books are adequate if the assumption holds that industrial arts unit shops may use specialization materials. If the individual feels that it is not feasible to use these materials, the textbooks are not adequate and should be revised or supplemented, or new books should be written.

### Forging

Only one textbook was submitted for the subject of forging. This book combines forging and welding. It is not possible to determine whether or not this one book constitutes an adequate treatment for the area. Selection is limited to only one book and this probably should not be considered as adequate. The manipulatory, general and technical information factors are present. Interpretive information is not strong and occupational information is missing. Consumer information is present only by implication. The need is not known in this area because this course is reported as metalwork and is not distinguishable from the group heading. The content of this book is shown as book number 3 in Table 21.

### Foundry

Foundry is represented by two books. One book is definitely for specialization or engineering, but it includes the factor content necessary in an industrial arts approach, particularly if used for the unit shop. The other book is addressed more nearly to industrial arts and contains design and planning factors which are not included in the first book. It also has projects which are not included in the specialization text. Foundry is usually taught as a part of the general metals course in indus-

trial arts. Since unit courses are rarely, if ever, taught in this subject for industrial arts purposes, these books should probably be classified as references for general metals.

### Handcrafts

Handcrafts constitutes two percent of the total offering in industrial arts work (see Figure 2, Page 100). Referring to Figure 1, Page 99, it is evident that books have been prepared out of proportion to this need. Nearly 18 percent of the books examined in this study were written for crafts or avocational uses. To explain this over-emphasis is not part of this study, but it should be pointed out that the diversity of subjects grouped under this collective heading accounts in part for the great number of books submitted in this area. Leathercraft, art metal and jewelry making, textiles, basketry, wood carving, shell craft, fly tying, paper crafts, ceramics, plastics, graphic arts, and other subjects may be dealt with in this area. If one book were used for each subdivision of the area, the resulting number would constitute more than a proportionate share of books for the area when compared to the percentage of offering. In most of the subject areas adequate provision has been made. Many of the handcrafts are orientated toward the avocational objective in industrial arts education and do not necessarily contain factors

for other purposes. That many of the books presented do meet other needs is to the credit of the authors and benefits education in general.

### General Arts and Crafts

The provision for general textbooks for handicrafts is not as good as might be expected from the above discussion. Four books were submitted covering general crafts. Several generalizations may be made. (1) The crafts approach carries the manipulative factors of tool description, operations and procedures, material descriptions, and suggested projects. (2) A certain amount of technical skill and knowledge is involved in the production of crafts items. These books meet this need. (3) The crafts should be creative experiences and should contain planning and design information. This factor is dealt with strongly in one text but rather weakly in three. It should be mentioned that one of the texts is suitable for elementary grades and probably should not be considered for use in the junior high school or beyond. As in other diverse subject areas, the problem of adequate treatment of a number of subjects in a competitive type text has not been solved. The largest volume examined contains approximately one thousand pages and is both expensive and unwieldy as a textbook. While this type of comprehensiveness is desirable,



textbooks of this type are too expensive for use by every student. This problem is the same problem that must be met in courses such as general shop, and the answer is not immediately evident. Research is needed to develop books with appropriate balance between comprehensiveness and penetration for the composite subject areas. Table 22 summarizes the content of the books in this category.

TABLE 22  
SUMMARY: GENERAL ARTS AND CRAFTS

Bk. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
Content Factors (symbols)															
1.	X	X*	X*	X	X	(X)	X*	X	X				X		Crafts
2.	X	X	X	X	X	(X)	(X)						X		Crafts
3.	(X)	X	(X)	X*	(X)	(X)	(X)						X		Crafts
4.	(X)	X	(X)	X*	(X)	(X)	(X)						X		Crafts
Textiles															
5.	(X)	X	X*	X	X	X	(X)	X*	(X)				X		Ind. Arts
Basketry															
6.	(X)	X	X	X	X	(X)							X		Crafts
Woodcarving															
7.	X	X*(X)					X						X		Crafts

Plastics

Plastics are frequently included in handicrafts courses. The classification of plastics as crafts will probably be discontinued in the near future because of the promise of these materials to become equal in rank with wood and many of the metals. Six books were examined. The content factors and patterns of use for these books are shown in Table 23. Probably the best treatment of plastics was not designed as a crafts approach but treats the crafts idea only incidentally. In this book the

TABLE 23

## SUMMARY: PLASTICS

Bk.	Content Factors (symbols)														Use Pattern
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1.	(X)	X*	X*		X*	X*		X	X	X		X	X		Ind. Arts - Spec.
2.	X	X*	X*	X*	X*	X	X		X				X		Crafts
3.		X*	X*	X*	X	X	X	(X)	(X)				X		Crafts
4.	(X)	X*	X	X*	X	X	X	(X)					X		Crafts
5.	X	X	X	X	X	X		(X)	(X)	(X)			X		Crafts
6.	X	X	X	X	X		(X)						X		Crafts

technical aspects of the use of plastics are well covered. Consumer knowledge, occupational and guidance information and specialization emphases are included. By supplementing

this book with projects it becomes the best approach for general education use. In general, the other five books are strong in operations and procedures, material descriptions, projects, general information, and technical information. Design and plan information is treated adequately but not strongly in three books. Two books contain interpretive information, but only one contains adequate occupational information. The plastics area may be covered well by the use of two texts. The subject of plastics is adequately treated for avocational purposes; however, selection is not adequate if the subject is taught as a materials area for general industrial arts objectives.

In industry this field is rapidly expanding, and books that are now up to date will be obsolete in ten years or less. Revisions will be necessary from time to time.

### Leathercraft

Leathercraft, as one of the most popular of the handicrafts, is generally dealt with in both single-subject books and in general crafts books. Six textbooks and three projects books were examined. One of the books was weak in general information and two books were weak in technical information. One book did not describe materials and tools. None of the books contain appreciable interpretive informa-



TABLE 25  
SUMMARY: ART METAL

Bk. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
Content Factors (symbol)															
1.	X	X*	X	X	X*	X*	X*(X)	X*	(X)				X*	X*	Ind. Arts
2.	(X)	X*	X	(X)	X	X*	X			(X)		X	X		Crafts & Spec.
3.	X	X	X	X	X	X	X			X		X	X		Crafts
4.	X	X	X	X	X	X	X				X				Crafts
5.	(X)	X	X	X	X	X	X		X						Crafts
6.	X	X*	X	(X)	X	(X)		(X)					X		Crafts

### Art Metal

Two types of books are found in this category. The following information is taken from Table 25. Four books were written on the subject of jewelry making, and two are concerned with treatments of metal for other art uses. All have crafts or avocational emphases and contain the manipulative and general-technical information factors. Materials for design and planning are treated in a superior manner by one book and acceptably by four of the remaining five. Two books have interpretive materials. Three of the books contain occupational information, but only one adequately treats this factor. Two have specialization emphases indicating that the approach is not the regular crafts approach. Both of the books with this factor also contain occupational information. These books have a combined crafts-specialization

approach and are concerned with saleable hand skills or crafts.

In general the conclusion may be made that the books examined constitute an adequate treatment of this subject area, particularly if art metals are considered as hand crafts materials and not as industrial materials.

### Ceramics

Ceramics, as an industrial arts subject, has not attained a highly significant popularity in terms of offerings. The percentage of all high school offerings is slightly higher than 0.1 percent, or in terms of industrial arts offerings less than one-half of one percent. The comparatively large number of books submitted does not reflect this lack of popularity. It should be noted that this area is often included in crafts courses and would not appear as a single course because it is reported under the composite heading. It should also be pointed out that fine arts uses this subject in many instances and that this area has become a popular hobby or home craft.

Table 26 summarizes the content factors of the nine books submitted. This is approximately 6 percent of the total number of textbooks examined. In general, the books are orientated toward manipulation and avocational use, but often contain strong general and technical information.



TABLE 26  
SUMMARY: CERAMICS

Bk. No.	1	2	3	4	5	Content Factors (Symbols)								14	Use Pattern
1.	X*	X*	X*(X)	X*	X*	X*(X)	(X)	(X)				(X)	X*	X*	Ind. Arts
2.	(X)		X		X*(X)	X*	X*	X*	X*	X				X	Ind. Arts (ref.)
3.	X*	X*	X*		X	X*(X)		(X)	X			X	X		Ind. Arts (Spec.)
4.	X	X*	X*	X*	X*	X	(X)	Keene Cement	Only	X*					Crafts
5.	X	X	X	X	X	X	X						X		Crafts
6.	X	X	X	(X)	X	X	X						X		Crafts
7.	X	X	X		X	X	X	(X)					X		Crafts
8.	(X)	X	X	X	X*(X)		(X)	X	(X)				X		(Ind.Arts)
9.	(X)	X	X		X	X		X					X		Crafts

Design and plan information is strongly emphasized in two of the books and adequately in three others. This plastic material medium lends itself to the creative approach and some of the best treatments of "creativity" are developed in these volumes. Except for one book, consumer education is neglected. Interpretive information is strongly emphasized in one book and is found in two books to an acceptable degree. Occupational information is strongly emphasized in one, is considered adequate in another, and is present to some degree in two books. Safety is treated in only one book; however, it should generally be understood that

this factor is not particularly applicable, since the processes involved are not generally hazardous.

Two books strongly emphasize avocational interest and six additional texts contain this emphasis to a degree. Values and attitudes are stressed in two books.

One of the books contains all of the pertinent factors for this area, and by using Ceramic Area Related Information<sup>1</sup> as a supplement all factors may be strongly treated. The four textbooks classified for industrial arts constitute an adequate provision in this area.

#### Home Mechanics

Home mechanics has achieved little popularity as an industrial arts subject. It is not possible to state whether the lack of popularity effects the textbook situation or whether the textbooks situation has adversely affected the initiation of home mechanics courses. Four books were submitted which are classified in this area. One book was classed as home mechanics because of its close relationship to this area. The general pattern in this area is one of manipulative factors, general information, a light treatment of technical information, consumer information and safety. In general, the approach is shallow

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<sup>1</sup>State Department of Education of New York, Ceramics Area Related Information Industrial Art's Comprehensive Shop Course, Albany, New York. Delmar Publishers, Inc. 1951.

and is not always based upon fact. The areas generally covered include drawing, woodworking, re-glueing and refinishing furniture, painting, patching plaster, re-upholstering, care of floors and finishes, electricity, care of appliances, windows and doors (hardware and screens, shade roller, et cetera), plumbing and heating, repairs, et cetera. Only one book is classified for industrial arts by the criteria of this study. In general, this field suffers from diversity of materials. The statements tend to be general and not well related to student understanding. Background materials are not developed, thus making the subject matter a group of unrelated facts. The area has possibilities for general education, but with the textbooks submitted not too much can be expected. At best the textbooks examined for

TABLE 27

## SUMMARY: HOME MECHANICS

Bk. No.	Content Factors (symbols)													14 Use Pattern
	1	2	3	4	5	6	7	8	9	10	11	12	13	
1.	(X)	X	X	X	X	(X)	X	X*			X			Crafts
2.	X	X	X	X		X*	X*	X*						Spec.
3.	X	X	X	X	X	X		X			X			Crafts
4.	(X)	X	(X)	X	X	(X)	(X)	X			X			(Ind. Arts)

this area are inadequate.

The related text which was submitted does not fall under the same criticism but might well serve as a basic reference or supplement for providing material in this area. The care and construction of furniture, judging fabrics, construction of draperies and slip covers, selection and use of period furniture, and the use of colors and paints in the home are covered by this book in a fairly comprehensive manner and might be used profitably by those teaching courses in this area. Table 27 summarized the content of these books.

#### Graphic Arts

Printing or graphic arts represents nearly 5 percent of the total offering in industrial arts subjects. The books submitted represent approximately 9 percent. If reference books and supplementary books are not considered, however, the percentages are nearly equal. Eight of the thirteen books in this area are textbooks. One book treats related information and serves to fill in the general education gaps in other textbooks. With the exception that projects are not provided in three of the books, the remaining seven books all contain provisions for manipulative work. General information and technical information are factors common to all books in this area. Five books emphasize planning procedures, two emphasize con-

sumer values, and six books contain occupational information and emphasize safety instruction. Only one book deals in terms of specialization. Two books stress avocational uses of graphic arts, and three contain values and attitudinal references. Two books may be used together to cover all factors pertinent to this area. Supplementary materials are provided in the form of project and reference materials for texts which are not otherwise complete.

#### Specialized Books and References

Two comprehensive treatments of silk screen process (one for the professional and one for school use) are available, and one book treats book binding for exploratory or avocational purposes. A complete treatment of type face recognition is also available as a reference. Two sets of job and operation sheets for printing are provided around which a course may be organized by using appropriate references. These sheets may also serve as projects for textbooks which omit this factor.

The books examined constitute an adequate provision in this area. Table 28 summarizes this information in table form.

#### Electricity

Electricity, as taught in high schools, constitutes 3.6 percent of all industrial arts offerings. The

TABLE 28  
SUMMARY: GRAPHIC ARTS

Bk. No.	1	2	3	4	Content Factors (symbols)										13	14	Use Pattern
1.	X	X	X	X	X*	X	X	X	X*		X				X	X	Ind. Arts
2.	(X)		X		X*(X)	X*	X*	X*			X					X	Ind. Arts (ref.)
3.	X	X	X		X	X	X		X	X	X						Ind. Arts
4.	X	X	X	X	X	(X)		(X)	(X)	X	X					(X)	Ind. Arts
5.	X	X	X	X	X*(X)			(X)	X*	X							Ind. Arts
6.	X	X	X	X	X	X	X	(X)	(X)	X							Ind. Arts
7.	X	X	X		X	X	X		X				X				Spec.
8.	X	X	X		X	X									X		Crafts
9.			X			X**											Spec.(ref.)
10.		X*		X*		X											Supplement, Printing Job Sheets
11.	X	X	X		X	X	X	(X)	(X)	X			X	X			Ind. Arts - Spec.*
12.	X	X	X		X	X	X	(X)	(X)	X							(Ind. Arts)
13.	X	X	X	X	X	(X)		X							X		Crafts, Nar- row Subj.
Photography																	
14.	X	X	X	X	X	X	X	X	X				(X)	X			Ind. Arts
* N. S. - Narrow subject field.																	

books submitted for inclusion in this study constitute 8.6 percent of all books submitted in subject areas. All of the books submitted are standard textbook approaches with the exception of one book which deals with related information



only. Thirteen books were submitted. Table 29 summarized the content and use of these books.

TABLE 29  
SUMMARY: ELECTRICITY

Bk. No.	1	2	3	4	5	6	Content Factors (symbols)							14	Use Pattern
							7	8	9	10	11	12	13		
1.		X	X	X*	X*(X)	X	X	X	X	X			X		Ind. Arts
2.			X		X*(X)	X*	X*	X*	X*	X				X	(Ind. Arts)
3.		X	X	X	X*	X	X*	X*	X		X*				Ind. Arts
4.	X	X	(X)	X	X*(X)			X	X	X					(Ind. Arts)
5.		X	(X)	X	X*(X)		X	(X)	X	X					Ind. Arts
6.(X)	X	X	X	X	X*	X*	X	X*							(Ind. Arts
7.		X	X	X	X*(X)						X				Lab.-Theory
8.		X	X	X	X	X	(X)	(X)							Lab.-Theory
9.	X	X	X	X	X		(X)								No. Pattern
10.		X	X	X	X	X									Lab.-Theory
11.		X	X	X	X								X		Crafts
12.			X		X	X*									Theory only
13.					X	X	(X)								Theory only

Textbooks for the electrical area have the following characteristics: Tools are seldom described, operations and procedures are given by ten textbooks, eleven books describe materials, and ten books contain projects. The projects are often in the form of experiments and do not result in a finished product. All of the books contain general information,

but two do not contain technical information to an observable degree, and four are weak in technical information. Planning and design factors are found in three books. Consumer information is emphasized by three, is satisfactorily included in two, and included to an observable degree in three books. Three books give interpretive information and two have weak treatments of this information. Five books stress safety. Only two books stress avocational use of electrical activities and none of the standard texts make value and attitudinal statements. None of the books stress specialization directly. Two of the books, however, show strength in the technical information factor and are, therefore, suitable for specialization purposes.

The one book which treats related information is an excellent supplement to fill the general educational omissions in the other textbooks. By using this book in conjunction with either of several of the other textbooks, an adequate coverage is obtained. This area can be considered as adequately provided for with six books which contain industrial arts emphasis and which provide an adequate selection in approach. There is a need in this field, however, for a comprehensive textbook written specifically for industrial arts use.

#### Photography

Photography is not often taught as an industrial

arts course, but it may be offered as part of graphic arts or as science. It constitutes less than one-half of one percent of all industrial arts offerings. One book<sup>1</sup> was submitted for this study. This treatment was written for an introductory course, and contains all of the manipulative factors as well as general and technical information pertinent to this type of course. In addition it contains materials for design, consumer information and occupational information. Stress upon specialization is only slight. Avocational emphasis is present.

#### Automobile Mechanics

Automobile mechanics represents slightly more than one percent of the total offerings in industrial arts. As in other courses making up a small percentage of the total offering, the percentage of books is comparatively high, being approximately four percent. This may be accounted for by the closely related offerings in industrial-vocational education and from the fact that books are often written in the "twilight zone" for use in both fields. Included in this area is a workbook for driver safety education, and a book treating transportation and power.

Eliminating these two, four textbooks dealing with automobile mechanics remain. One of these is a supple-

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<sup>1</sup>This book is No. 14, Table 28, Summary: Graphic Arts.

mentary text using a blueprint reading and sketching approach to an understanding of technical and general information in automobile mechanics. If properly used this supplement should prove very valuable, particularly where knowledge is desired without an extended use of laboratory equipment. It is well adapted to use for developing specialized knowledge of structural and operational principles. The book cannot be considered a textbook because it depends upon references for information and does not contain materials other than blueprint exercises.

TABLE 30

## SUMMARY: AUTOMOBILE MECHANICS

Bk.	Content Factors (symbols)													14 Use Pattern
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	
1.	(X)	X	(X)	X*	X*	X	(X)	X*	X		X*			X Ind. Arts
2.		X	X*		X*	X*	X	X*(X)	(X)					Ind. Arts
3.					X	X	X	X*	X		X			(Ind.Arts)
4.				X	(workbook)									
5.				X	(Driver Ed. Wrkbk.) X*									
Transportation and Power														
6.		X		X	X*(X)		(X)				X			No Pattern

Of the three textbooks in automobile mechanics, two are orientational in scope and one integrates the principles

of physics and the principles of automobile mechanics. This book also contains materials valuable for orientational purposes. Two of the books are adaptable for both orientational and specialization purposes, and one is a typical orientational textbook.

None of the three describes tools and only one provides projects or problems. One book does not give operations and procedures and does not give material descriptions. The manipulative factors are included in only one book. All three contain general information, technical information, and deal thoroughly with consumer values. Two have interpretive materials, and the other contains a weak treatment of this factor. One deals with occupational information, though weakly; two books stress driving safety. None of the books emphasize avocational or specializational factors. One book makes value and attitudinal statements and inferences.

The three texts discussed above are all orientational in approach and each does an acceptable job. In view of the creditable coverage and the quality of the books submitted, it must be said that this area is well provided for. It should be understood that each of these books is prepared for courses of at least two semesters, and that no textbook was submitted which makes a rapid survey in this area.

### Transportation and Power

One book in the field of transportation treats automobile safety, gasoline and diesel engines, fuel and electrical systems in automobiles, lubrication and cooling, and power application and control. The treatment is rather weak, due to the broad area treated. Manipulative factors, consumer skills and knowledge, and technological orientation is developed to a degree. This treatment is recommended for orientational courses in junior high school only.

### General Reference

Books for general reference purposes are not of sufficient number to warrant a discussion of the composite category; therefore, each book will be discussed separately. The books in this category vary from one factor treatment to comprehensive treatments. Table 31 gives the content and use pattern for each book.

TABLE 31

SUMMARY: GENERAL REFERENCE

Bk. No.	Content Factors (symbols)													Use Pattern
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<b>Planning</b>														
1. (X)					X	(X)	X**		X	(X)	X*			X** Ind. Arts
<b>Materials and Processes</b>														
2. (X) X		X*	(X)	X*	X*									Ind. Arts & Spec.
3.		X		X			X	X	X					Ind.Arts(ref.)



TABLE 31 - (Continued)

Bk.	Content Factors (symbols)														
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Use Pattern
Shop Safety															
4.											X***				Ind. Arts & Spec.
Finishing Materials and Methods															
5.	X*	X*	X*		X*	X*	X*	X		X*	X*	X			Ind. Arts & Spec.

Shop Safety Education

Shop Safety Education<sup>1</sup> is a one-factor book and comprehensively deals with safety in the school shops. This book is addressed to teachers and administrative officers of the school and should be considered as a professional book rather than a textbook for classes of less than college grade.

Finishing Material and Methods

Finishing Materials and Methods<sup>2</sup> is a multifactored book and is classed as general reference because it is useful to several areas but does not warrant a separate clas-

<sup>1</sup>Shop Safety Education, The University of New York, The State Education Department, New York: 1949.

<sup>2</sup>George A. Soderberg, Finishing Materials and Methods, Bloomington: McKnight and McKnight Publishing Company, 1952.

sification. This treatment contains the factors for a good industrial arts approach for finishing and should find good use in woodworking and metal classes to supply information for the finishing processes, occupations connected with finishing processes, and information on design related to color and finish. The book contains both general and technical information.

### Industrial Materials

Two books were submitted with information upon materials. Materials and Processes<sup>1</sup> describes the sources and processing which organizes information concerning industrial materials usually studied in industrial arts classes. While Industrial Materials<sup>2</sup> is not a textbook in the technical sense, it is a valuable aid for the location and organization of pertinent materials.

### Student Planning

The Student's Planning Book - Industrial Arts and Vocational Classes<sup>3</sup> is listed as reference. This listing

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<sup>1</sup>Max Kohn and M. J. Starfield, Materials and Processes, The Macmillan Company, 1952.

<sup>2</sup>Industrial Materials, The University of the State of New York, The State Education Department, Albany: 1949.

<sup>3</sup>Gerald B. Baysinger and G. Harold Silvius, The Student's Planning Book, Scranton: International Textbook Company, 1950.

is due to the miscellaneous nature of the book. The book is designed as a workbook for student use, but it should prove valuable as a reference for textbooks which do not provide sections on student planning. This treatment covers student personnel work in the classroom thoroughly and should prove to be a valuable aid to the university or college teacher of industrial arts methods.

#### Summary

The chief value in the references cited is in the use that the books may serve in filling the gaps in other texts. In teacher education institutions offering a course in finishing or in teaching method and administration, the books may become textbooks or auxiliary materials.

## CHAPTER VI

### CONCLUSIONS AND RECOMMENDATIONS

Basic background materials have been presented, criteria developed, and data compiled and interpreted in order to determine the status of the textbook as it is used in industrial arts education. The purpose of this chapter is to portray some general conclusions and recommendations.

While many of the basic problems of industrial arts education are beyond the scope of this study, some of these are closely related to the problems of textbook selection and use. The conclusions of this chapter define several of the general problems and recommendations suggest an approach to their solution. The data presented in this study provide a basis for the following:

1. The definition of industrial arts and teaching practices should be carefully examined in order to bring them into congruency.
2. The relationships of industrial arts and industrial-vocational education should be explicitly defined and an agreement reached concerning the discrete functions of each of the complementary divisions of industrial education.
3. This study indicates that the textbook needs for the industrial arts unit shop and those for beginning

Industrial-vocational shops are closely related. An agreement should be reached upon these basic needs. This should provide a basis for a better understanding of the specific functions of each area and should lead to better working relationships.

4. The lack of adequate criteria for textbook content, for textbook classification, and for textbook selection presents a serious problem in the field of industrial arts education. The lack of textbooks with adequate content restricts the growth and development of a complete industrial arts program. The lack of classificatory and selective criteria makes intelligent selection of textbooks very difficult and leads to inefficiency and confusion. Criteria should be developed and adopted by professional groups. Selective criteria and procedures should be developed for use by individual teachers and by groups concerned with state and municipal selection or adoption of textbooks for the classroom. Publishers should use the developed classification criteria for catalogue descriptions of their textbooks.

5. To achieve an adequate coverage of all industrial arts objectives it is necessary to use two or more books in many of the subject areas. Selective criteria should provide for an intelligent selection of complementary textbooks. Selection should be based upon the suitability of

content for use in achieving the objectives of industrial arts. The methods employed in this study are recommended as one approach to this problem.

6. At present, the comprehensive textbook is non-existent in many of the subject areas. For purposes of clear organization, comprehensive textbooks should be specifically written for all sub-divided areas of industrial arts. The textbooks should provide complete coverage of both subject area and objectives. The most critical need exists in the comprehensive general shop area. The need in this area should be brought to the attention of the profession and to textbook publishers.

7. In order to provide for continued growth of industrial arts, the production of textbooks should be based upon need. An inventory of all available textbooks should be established and continuously reviewed to insure proper guidance to authors and publishers in the field of industrial arts. Future needs should be anticipated and provisions should be made to meet them as they may occur.

8. The quality of textbooks should be improved through adequate research. Authorship should reflect valid experience in the areas covered. Only qualified individuals should be encouraged to write the textbooks needed by the profession. Textbooks with errors in information and approach should either be corrected or they should be



rejected for use as industrial arts textbooks.

9. Textbooks used in industrial arts classes are often written for other purposes. The analyses of this study show that 31.6 percent of the books examined were written for crafts use, 21.3 percent were written for specialization, and 9.2 percent were written without any specific use pattern. According to the authors' statements, 26.3 percent of the books were addressed "to whom it may concern". It is recommended that all industrial arts textbooks be specifically prepared to meet industrial arts objectives, and that books written for other purposes be used only for reference needs.

10. The production of textbooks for industrial arts use is controlled by too few individuals. Eight of each ten books found to contain suitable materials for industrial arts use were produced by only five editors. Two authors working jointly have accounted for one-fifth of all of the textbooks with suitable industrial arts content. It is recommended that a liaison committee be appointed to represent the profession in its relationships with publishers and authors. This committee should provide advice and guidance to authors and editors concerning the needs and problems in the field of industrial arts and should examine new books in order to classify and inventory them.

11. Further studies should be made of the industrial arts textbook to determine the validity of this study and to add to the data provided by this study.

12. A study should be made of the textbooks which are being used in the classroom and laboratory in order to assess the possible influence of textbooks and the authors and editors who produce them.

13. A study should be made to determine the suitability for use in industrial arts of all books treating industrial arts subject matter. All suitable textbooks and reference sources should be catalogued for appropriate use.

14. A logical classification system should be developed for all subject matter areas and for the major sub-divisions of each area. Each area and each sub-division should be concretely defined and criteria for placement of materials should be developed.

15. A study should be made to determine both the appropriate levels of use for all textbooks properly listed for industrial arts and the needs in relation to reading and comprehension abilities of students. This study should deal with concept difficulties as well as word-count techniques.

16. The textbook is a tool to be used in achieving educational objectives. The way in which the tool is constructed determines the function which it may best serve.

The skill with which it is used determines the quality of the educational product. It is the duty of every qualified teacher to be able to recognize the correct tool for the task and to be able to use the tool effectively. The proper use of the textbook should be given appropriate emphasis in teaching methods courses as an aid to more intelligent teaching and to better learning. Properly used, the textbook remains one of the best teaching aids available.

## APPENDIXES

- A. Annotations of Textbooks Used in This Study
- B. A Letter of Request for Textbook Loans

## APPENDIX A

The annotations in Appendix A are organized as follows:

- A. Bibliographic entry
  - 1. Author's/authors' name/names
  - 2. Title of book
  - 3. Publisher and date of copy right/copyrights
- B. Descriptive information
  - 1. Size of book (to the nearest half-inch)
  - 2. Binding
  - 3. Number of pages
  - 4. Special aids (index, illustrations, bibliography, glossary, projects, and the number of projects)
- C. Approach to subject matter
- D. Topic content (taken from table of content)
- E. Special features (if any)
- F. Symbols for content factors
- G. Symbols for objectives of industrial arts
- H. Use pattern derived from content factors
- I. Subject classification

Strength of factors and objectives are designated as follows:

X\* - Superior treatment or inclusion is shown by the asterisk

APPENDIX A - Continued

X - Adequate treatment or inclusion is shown by the symbol only

(X) - Weak treatment or inclusion is shown by enclosure in parenthesis

The symbols and factors represented are designated as follows:

## Content Factors

## Symbol

1. Tool descriptions
2. Operations and procedures
3. Material Descriptions
4. Projects
5. General information
6. Technical information
7. Design and planning information

## Symbol

8. Consumer information
9. Interpretive information
10. Occupational information
11. Safety information
12. Specialization emphases
13. Avocational emphases
14. Values and attitudinal information.

## Objectives of Industrial Arts

## Symbol

- A. Manipulation
- B. Technical skill and knowledge
- C. Consumer skill and knowledge
- D. Orientation to technology
- E. Guidance

## Symbol

- F. Personal safety
- G. Specialization
- H. Avocation
- I. Personal development.



## Automobile Mechanics

Frost, James V. Fundamentals of Automotive Mechanics. New York: John Wiley and Sons, Inc., 1943, rev. 1946. 5-1/2" x 8-1/2", cloth bound, pp. 536, ind., ill., appendix, glossary.

Theory centered. Treats the automobile in terms of physical science and mechanical principles. Many illustrations by analogy. Questions for review.

The automobile; chassis, running gear, and body; power unit; power train; cooling system; fuel system; electrical system; lubrication; driver safety.

Content: 5 6 7 8 9\* 11

Objectives: B\* C\* D F G

Use Pattern: Industrial Arts and Specialization

Subject: Automobile Mechanics

Glenn, Harold T. Exploring Automechanics. Peoria: Charles A. Bennett Co., Inc., 1952.

6" x 9", cloth bound, pp. 313, ind., ill., ref.

Instruction unit approach: introduction, references, questions, reading materials, laboratory projects with tools and procedures. Not complete without reference materials.

Becoming a better automobile driver; becoming an intelligent user of the automobile; the automobile engine; the electrical system; the chassis and the drive mechanism.

Content: (1) 2 (3) 4\* 5\* 6 (7) 8\* 9 11\* 14

Objectives: A\* B C\* D E (G) I

Use Pattern: Industrial Arts

Subject: Automobile Mechanics

Kuns, Ray F. Automotive Essentials. Milwaukee: The Bruce Publishing Co., 1935, rev. 1937, 1939, 1941, 1951. 6" x 9-1/2", cloth bound, pp. 545, ind., ill.

Broad subject unit organization: orientational materials for the development principles, (not a repair manual), and questions for review and for research.

Automobile design; power plant and their functioning parts; checking, reconditioning and reassembling engine parts; engine theory and parts design; lubricating the engine; cooling the engine; fuel systems; ignition; starting motors and generators; car wiring and lighting; the storage battery; transmissions; clutches; automatic transmissions and hydraulic drives; the rear axle; brakes; front suspension; steering gears; springs, shock absorbers, and wheel suspension; wheels rims and tires;

# Automobile Mechanics - Continued

outboard motors; motorcycles; motorbikes and scooters.

Content: 2 3\* 5\* 6\* 7 8\* (9) (10)

Objectives: B C\* D G

Subject: Automobile Mechanics

Sinnamon, Henry E., Williams, W. B., et al,  
Automotive Blueprint Reading and Sketching. Albany, New  
York: Delmar Publishers, Inc., 1952.

7-1/2" x 10", paper bound, pp. 95, tab. cont., bibl.

A three-part series workbook approach. Blueprint reading  
and sketching for developing understanding of theory and  
construction. Referenced to manufacturer's manuals and  
to textbooks.

Tool identification and use; frame and front end; brake  
assembly; engine assembly clutch assembly; transmissions;  
rear end assembly; electrical systems.

Content: 4 (workbook)

Objectives: B\*\* (D) C\*\*

Use Pattern: No Pattern (reference) Industrial Arts and  
Specialization.

Subject: Automobile Mechanics, Workbook.

Allen, Thomas H. Highway Safety For All. Bloomington:  
McKnight and McKnight Publishing Co., 1949.

7-1/2" x 10", paper bound, pp. 112, tab. cont., ill., ref.

Workbook for Driver Education. Course Outline.

Content: 4 11\*\* 14\*\*

Objectives: B\* C\* E\* F\*\*

Use Pattern: Industrial Arts, reference workbook.

Subject: Automobile Mechanics, driver education.

Johnson, William H., and Newkirk, Louis V.  
Transportation and Power. New York: The Macmillan Co.,  
1944.

8" x 11", paper bound, pp. 126, ind., ill., ref., bibl.

Information and operation unit approach. Questions for  
discussion and for review.

Early forms of flying; the airplane; the principles of  
flight; aircraft engines; automobile safety; gasoline and  
diesel engines; fuel and electrical systems in automobiles;  
lubrication and cooling; power application and control.

## Automobile Mechanics - Continued

Content: 2 4 5\* (6) (8) (9) 11  
 Objectives: (A) (C) (D) F  
 Use Pattern: Industrial Arts (very weak pattern)  
 Subject: Automobile Mechanics (Transportation and Power).

## Ceramics

Binns, C. F. The Potters Craft. New York: D. Van Nostrand Co., Inc., 1910, rev. 1922, 1947.  
 5 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ ", cloth bound, pp. 125, ind.

Essay approach.

Pottery; porcelain; the nature and properties of clay; the preparation of clay; mold making and plaster; cases and working molds; building by hand; the potter's wheel; turning; cups, saucers, and plates; casting; glazes and glazing; the fire; high temperature wares; historical information; and interpretation of the place of pottery in our culture.

Content: (1) 2 3 5 6 9 13

Objectives: A B (D) H

Use Pattern: Crafts

Subject: Ceramics, Pottery

Dougherty, J. W. Pottery Made Easy. Milwaukee: The Bruce Publishing Co., 1939.  
 6" x 9", cloth bound, pp. 173, ind., ill., bibl., tool, supply, and equipment lists.

Introduction; pottery and its history; the technique of pottery making; clay and its preparation; hand work in clay; making hand molds; casting and pressing in hand molds; working on the potter's wheel; pressing ware with revolving molds; decorating and glazing; kilns and their operation.

Content: 1 2 3 5 6 7 (8) 13

Objectives: A\* B (D) H

Use Pattern: Crafts

Subject: Ceramics, Pottery

Duncan, Julia, and D'Amico, Victor. How to Make Pottery and Ceramic Sculpture. New York: The Museum of Modern Art, 1946.

# Ceramics - Continued.

Distributed by International Textbook Co.

7 $\frac{1}{2}$ " x 10", cloth bound, pp. 92, ind., ill., bibl.,  
Progressive project centered approach. Emphasis upon  
creativity.

Ceramic processes and materials; where to buy ceramic  
materials; twenty graded projects. Projects illustrating  
sculpture, pinch pot, coil method, slab construction,  
decorative processes, ceramic jewelry, press molds and slip  
molds.

Content: 1 2 3 4 5 6 7 13

Objectives: A B H

Use Pattern: Crafts

Subject: Ceramics, Pottery

Jenkins, Horace R. Practical Pottery. Milwaukee:

The Bruce Publishing Co., 1941.

6" x 9", cloth bound, pp. 185, ind., ill., ref.

Information and operation centered approach.

History; clay and clay preparation; hand built pieces;  
suggested designs and decorations; plaster of paris and mold  
making; casting; throwing; turning; trimming; drying; throw-  
ing large pieces; tile making; pressing and making irregular  
shapes; clay work in the school; commercial production;  
biscuit firing; glaze and its composition; matted and fritted  
glazes; recipes for the potter; glazing and glost firing;  
problems and defects; equipping a pottery shop; general in-  
formation on material compositions; the joys and sorrows of  
pottery making; appliances and materials; and directions for  
making equipment.

Content: 1\* 2\* 3\* 5 6\* (7) (9) 10 12 13

Objectives: A B\* D E G H

Use Pattern: Industrial Arts

Subject: Ceramics, Pottery

Johnson, William H., and Newkirk, Louis V.

The Ceramic Arts. New York: The Macmillan Co., 1942.

8" x 11", paper bound, pp. 156, ind., ill., ref.

Information unit approach. Discussion, questions, pro-  
jects and procedures.

Ceramics, a foundation of modern industry; making pottery;  
industrial methods of manufacturing pottery; producing  
plastics in the laboratory; adapting glass to modern living;  
shaping ornamental alabaster; making and using cement;

# Ceramics - Continued.

concrete for strength and decoration.

Content: (1) 2 3 4 5\* (6) (8) 9 (10) (13)

Objectives: A (B) (C) D (E) (H)

Use Pattern: Industrial Arts

Subject: Ceramics, General

Olson, Delmar W. Pottery: Getting Started In Ceramics. Scranton: International Textbook Co., 1953.

7½" x 10", cloth bound, pp. 110, ind., ill., bibl., ref.

Information, discussion and illustration. Procedures in

text. Special treatment of design in clay, how to build

equipment, and how to work native clays.

History of pottery; design in clay; about clay; hand form-

ing methods; decorating techniques; glazes and glazing;

firing your own ware; the potter's wheel; mold making and

casting; how industry does it; equipment for a hobby shop

and a school shop.

Content: 1\* 2\* 3\* (4) 5\* 6\* 7\*\* (8) (9)

(10) (12) 13\*\* 14

Objectives: A\*\* B (C) D\* (G) H\* I

Use Pattern: Industrial Arts

Subject: Ceramics, Pottery

Radtke, O. Arnold. Keene Cement Craft. Milwaukee: The Bruce Publishing Co., 1943.

6" x 9½", cloth bound, pp. 114, ind., ill. proj. 25.

Projects centered: drawings, photographs, materials, and procedures.

Casting; scagliola; flat work; coloring; polishing; marbles.

Content: 1 2\* 3\* 4\* 5\* 13\*

Objectives: A\* H\*

Use Pattern: Crafts

Subject: Ceramics, Keene Cement

The University of New York, State Education Department.

Ceramics Area Related Information Industrial Arts Comprehensive General Shop Course. Albany, New York: Delmar Publishers, Inc., 1951.

7½" x 10½", cloth bound, pp. 124, ind., ill., bibl.

Unit of study or topical approach: the story, objectives,



### Ceramics - Continued.

references, assignments, and topical tests.

Relationships in the following areas: planning, social-economics, guidance, science, safety hygiene, and consumer values.

Content: (1) 3 5\*\* (6) 7\* 8\* 9\*\* 10\*\* 11 14  
 Objectives: (B) C\* D\* E\* I  
 Use Pattern: Industrial Arts  
 Subject: Ceramics, related information

deVegh, Geza, and Mandi, Albert. The Craft of Ceramics. New York: D. Van Nostrand Co., Inc., 1949.

7 $\frac{1}{2}$ " x 10", cloth bound, pp. 143, ind., ill., glossary, source of materials.

Lesson unit approach: materials, comments, explanations, procedures, and precautions. Project centered.

General introduction; plastic clay and flower ornamentation; slab method; coil method; hand-pressing method; slip casting; mold making; potter's wheel; model making; ceramic decoration; glaze decorating; kilns and firing techniques.

Content: 1 2 3 (4) 5 6 7 13  
 Objectives: A B (D) H  
 Use Pattern: Crafts  
 Subject: Ceramics, Pottery

### Electrical Work

Crawford, John E. Practical Electricity. Milwaukee: The Bruce Publishing Co., 1939.

5 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ ", cloth bound, pp. 265, ind., ill., vocabulary list.

Discussion, general and technical information, summary, and problems applying information.

Circuits - highways for electrons; current - electrons flowing; resistance - crowding the electrons; voltage - pushing electrons; direct current generators - organizing electrons; direct current motors - electrons working; power - energy of electrons; alternating current -- reversing electrons; distribution systems - delivering electrons; electricity in the home - domestic electrons; tesla-coil project; the future of electricity; electrification.

Content: 2 3 (4 exp.) 5 6 (8) (9)  
 Objectives: (A) B (C) D



# Electrical Work - Continued.

Use Pattern: Theory - Laboratory  
Subject: Electrical Work

Collins, Merle D. Projects in Electricity.  
Bloomington: McKnight and McKnight Publishing Co., 1941.  
7-1/2" x 10", paper bound, pp. 80, ill., proj. 21.  
Information and project centered.  
Materials and equipment; soldering; electromagnetism; coil construction; simple switch; how a buzzer works; buzzers; how a bell works; bells; telegraph set; the principle of the electric motor; commutator construction; brushes; armature construction; motors.  
Content: 2 3 4 5 13  
Objectives: A (B) (D) H  
Use Pattern: Crafts  
Subject: Electrical Work

Cornet, Wendell H. Principles of Electricity.  
Bloomington: McKnight and McKnight Publishing Co., 1943, rev. 1952.  
6" x 9", cloth bound, pp. 335, ind., ill.  
General and technical information, chapter summaries, review questions, experiments and questions on each experiment.  
List of experiments; magnetism; static electricity; Ohm's law; electric current and chemical action; work, energy, and power; electric currents and magnetism; electric meters; direct current dynamos; alternating current; electronics at work; appendix (tables of equivalents, conversion tables, wire gauges, properties of metals and alloys, electrical abbreviations, natural trig. functions).  
Content: 2 3 (4 exp.) 5 6  
Objectives: A B\* (C) D\*  
Use Pattern: Theory - Laboratory  
Subject: Electrical Work

Dragoo, A. W., and Porter, C. B. General Shop Electricity. Bloomington: McKnight and McKnight Publishing Co., 1935, rev. 1941. 1946.  
8" x 10", paper bound, pp., 116, ind., ill., ref., teaching aids., proj. 26.  
Unit approach. Objectives, projects, materials, general information, working drawings, photographs, and procedures for

Electrical Work - Continued.

construction.

Simple wiring circuits; magnetism; direct current; alternating current; residential wiring; radio; occupational information; appendices.

Content: 2 3 4\* 5\* (6) 7 8 9 10 11 13

Objectives: A\* B C E F H (I)

Use Pattern: Industrial Arts

Subject: Electrical Work

Eaton, J. R. Beginning Electricity. New York:

The Macmillan Co., 1952.

6" x 9", cloth bound, pp. 361, ind., ill.,

Discussion, chapter summaries, questions and problems.

The electric circuit; Ohm's law; the power law; the work law; Kirchoff's laws of current and voltage; magnetic fields; conductors in magnetic fields; Faraday's laws; Lentz's law; the inductance coil; the capacitor; switching; Direct current applications: batteries, circuit arrangements, conductors and resistors, direct current generators, motors, miscellaneous equipment. Alternating current concepts: concepts: circuits; vector diagrams; voltage and current relations in a resistor, inductor, and capacitor. Alternating current application: circuit arrangements, transformers, generators, three-phase circuits, motors. Electronics: the structure of matter, conduction processes, vacuum tubes and circuits. Measurements: electrical instruments. Communications: telegraph, telephone, radio, television and radar.

Content: 5 6 (8)

Objectives: B\* (D) (G)

Use Pattern: Theory Only

Subject: Electrical Work

Johnson, William H., and Newkirk, Louis V.

The Electrical Crafts. New York: The Macmillan Co., 1943.

8" x 11", paper bound, pp. 144, ind., ill., ref., bibl.

Information unit approach. Discussion, questions for discussion and review.

Electricity in the modern world; electricity and magnetism; working with current electricity; electrical communication; radio; lighting; electrical power; and electrical heating.

Content: 1 2 (3) 4 5\* (6) 9 10 11

Objectives: A (B) (C) D (E)

Use Pattern: Industrial Arts

Subject: Electrical Work

Electrical Work - Continued.

Jones, E. W. General Electricity. Bloomington: McKnight and McKnight Publishing Co., 1950. 7-1/2" x 10", paper bound, pp. 89, tab. cont., ill., ref. Laboratory unit approach: Information, illustrative projects, tests for review and understanding. Magnets and magnetism; door bells and buzzers; electric current; voltage; batteries; resistors; conductors and insulators; watts, kilowatts, kilowatt hours; electric fuses; circuits of the home; electric cord; heating and cooking devices; safety rules; electric lighting; the storage battery; generators and motors; induction coils and transformers; automobile circuits; telephone and telegraph; radio; circuit defects; soldering; shop projects; and reference books.

Content: 2 3 4 5\* (6) 11  
 Objectives: A (B) (D) F  
 Use Pattern: Theory - Laboratory  
 Subject: Electrical Work

Jones, E. W. Fundamentals of Applied Electricity. Milwaukee: The Bruce Publishing Co., 1943. 6" x 9", cloth bound, pp. 336, ind., ill., bibl. Theory, illustrative experiments, review and test questions. Electricity (historical); fundamental quantities and their measurement; electric batteries and electroplating; magnetism, its production and use; electric circuits; direct-current systems; alternating-current systems; coils, condensers, and transformers; electricity in the home; elements of radio; small motors; building the small transformer; experimental apparatus; shop equipment; projects for construction.

Content: (1) 2 3 4 5\* 6\* 7 8\*  
 Objectives: A\* B\* D  
 Use Pattern: Industrial Arts  
 Subject: Electrical Work

Lush, Clifford K., and Engle, Glenn E. Industrial Arts Electricity. Peoria: Charles A. Bennett Co., Inc., 1946. 6" x 9-1/2", cloth bound, pp. 142, ind. ill., comprehensive test. Unit approach: introduction, job sheets, discussions of results of experiments, extra jobs for the fast learner, reading pretest.

# Electrical Work - Continued.

Introduction to the world of electricity; magnetism and how it is related to electricity; sources of electricity and electrical energy; magnetism induced by electrical flow; the flow of electricity and conducting materials; low-voltage circuit wiring of signal devices; heat from electricity applied to everyday problems; lighting with electricity and electrical lighting devices; house wiring, electrical conduits, and switches; communication by means of electrical transmission; electrical power; and the electrical generator and motor.

Content: 2 (3) 4 5\* (6) 8 (9) 10 11  
 Objectives: A\* (B) C D (E) F  
 Use Pattern: Industrial Arts  
 Subject: Electrical Work

Timbie, W. H. Essentials of Electricity. New York: John Wiley and Sons, Inc., 1913, rev. 1931. 5" x 7", cloth bound, pp. 297, ind., ill.

Electrical Theory.

Ohm's law; simple electric circuits; combination of series and parallel systems; electric power; wire and wiring systems; batteries; electrical devices and circuits; electrical communication systems; generators and motors; meters and instruments; appendix.

Content: 3 5 6\*  
 Objectives: B (D) G  
 Use Pattern: Theory  
 Subject: Electrical Work

Tustison, F. E., and Ruehl, P. W. Electrical Essentials for the Practical Shop. Milwaukee: The Bruce Publishing Co., 1952.

8" x 11", paper bound, 36 instruction sheets, cont., ill. Instruction unit approach: theory, equipment and tools, procedure, questions, references, and suggested activities. Electricity, conductors, magnetism, and electromagnetism; communications, induction and motors; electrical appliances; electric wiring; meter reading; storage battery care; Ohm's law; and appendices.

Content: 1 2 3 (4 exp.) 5 (8)  
 Objectives: A (B) D  
 Use Pattern: No pattern  
 Subject: Electrical Work

Electrical Work - Continued.

The University of the State of New York, State Education Department. Related Information, Electricity Area, Industrial Arts Comprehensive General Shop Course. Albany, New York: Delmar Publishers, Inc., 1950. 7½" x 10½", cloth bound, pp. 158, ind., ill., bibl. Unit of study or topical approach: the story, objectives, references, assignments and topical tests. Relationships in the following areas: Planning, social-economics, guidance, science, safety and hygiene, and consumer values.

Content: 3 5\* (6) 7\* 8\* 9\*\* 10\*\* 11 14  
 Objectives: (A) (B) C\* D\*\* E\*\* F I  
 Use Pattern: Industrial Arts  
 Subject: Electrical Work

Wright, F. B. Electricity in the Home and on the Farm. New York: John Wiley and Sons, Inc., 1935, rev. 1941, 1950. 5½" x 8", cloth bound, pp. 370, ind., ill.

Part I, Principles and Applications of Electricity. Importance of electricity to the farm and home; the nature of electricity; electric circuits; electrical terms and measurements; magnetism; electromagnetic induction and some of its applications; alternating current; power generating, transmission, and distributing systems for alternating currents; wiring systems for the farm and for the home; planning a wiring system; electric motors.

Part II, Jobs and Study Activities. Experiments, field trips, and practical applications of the principles contained in part I.

Content: 2 3 4 5\* 6 7\* 8\* 9 11\*  
 Objectives: B C\* D F  
 Use Pattern: Industrial Arts  
 Subject: Electrical Work

## General Reference

Baysinger, Gerald B., and Silvius, G. Harold. The Students Planning Book, Industrial Arts and Vocational Classes. Scranton: International Textbook Co., 1941, rev. 1943, 1950. 8½" x 11", paper bound, pp. 32 text, pp 32 forms, letter to parents, safety pledge.



General Reference - Continued.

Operation sheet approach to project planning. Space provided for identification of job, references, bill of materials, issue record, procedure, tools and equipment, test answers, evaluation of project by student and class officers, sketching space.

Planning your student-directed organization; duties of class officers; how to plan a project; evaluating the finished product; useful tables, tool index, record form.

Advanced form contains safety rules for machine operation.

Content: (1) 5 (6) 7\*\* 9 (10) 11\* 14\*\*

Objectives: (A) D\*\* I\*\*

Use Pattern: Industrial Arts

Subject: General Reference, Student Planning

Kohn, Max, and Starfield, M. J. Materials and Processes. New York: The Macmillan Co., 1952.

5-1/2" x 8-1/2", cloth bound, pp. 476, ind., ill., bibl., sources of audio-visual aids.

Semi-technical information: characteristics of materials, sources, processing for use, review questions, and suggested activities.

Wood and its products: lumber, plywood, paper, and forestry.

Fuels: coal, coke, petroleum, and gases.

Ceramics: bonding materials, structural clay, and glass.

Metals: iron and steel, nonferrous metals (heavy and light); casting, joining, and removing metals; and corrosion resistance.

Plastic materials: natural and synthetic rubber, and plastics.

Content (1) 2 3\*\* (4) 5\* 6\*

Objectives: (A) B D\*

Use Pattern: Specialization and Reference, industrial arts

Subject: General Reference, Materials

Soderberg, George A. Finishing Materials and Methods. Bloomington: McKnight and McKnight Publishing Co., 1952.

6" x 9", cloth bound, pp. 309, ind., ill.

Operation and information unit organization.

Finishing materials; their sources, manufacture, specifications, characteristics, and uses.

Finishing methods; brushing, spraying, dipping, tumbling, and roller coating.

Finishes: oleoresinous varnishes and enamels, synthetic varnishes and enamels, cellulose lacquers and enamels, shellac,



General Reference - Continued.

paint, metallic paint, luminescent paint, oil-resin emulsion paint, plastic paint, wrinkle finish, hammered-effect finishing materials, flock, fire retardants, pearl essence, stains, wood filler, bleaches, paint and varnish removers, coated and polishing abrasives, waxes, and pressure sensitive masking tape.

Special sections: selection of finishes, colors, how to tape and finish a dry wall, recommended safe practices in finishing, and opportunities in the painting industry.

Content: 1\* 2\* 3\* 5\* 6\* 7\* 8 10\* 11\* 12

Objectives: A\* B\* C D\* E\* F G H

Use Pattern: Industrial Arts and Specialization

Subject: General Reference, Finishing

The University of the State of New York, The State Education Department. Industrial Materials.

Albany, New York: Delmar Publishing, Inc., 1949.

7 $\frac{1}{2}$ " x 10 $\frac{1}{2}$ ", cloth bound, pp. 128, ind., bibl.

Suggested instructional units on the origin, characteristics, properties, and manufacture of the basic materials of industry.

Forest products; paper; textiles; leather; paints; rubber; plastics; glass; ceramics; and metals.

Content: 3 5 7 8 9

Objectives: B C D

Use Pattern: No Pattern, Industrial Arts - Reference

Subject: General Reference, Materials

The University of the State of New York, The State Education Department. Shop Safety Education.

Albany, New York: Delmar Publishers, Inc., 1949.

7 $\frac{1}{2}$ " x 10", cloth bound, pp. 306, ind., bibl.

Pertinent facts and practices in outline.

Accidents and accident prevention; administration of the school shop safety program; making the school shop a safe place to work; guarding machinery; maintaining a safe place to work; personal protective devices; accident prevention with problem students; hand tool and portable electric tool safety; safe practices in school shops; installing an effective accident prevention program in school shops; and, promotion of industrial safety by public agencies.

Content: 11\*\*\*

Objectives: F\*\*\*

General Reference - Continued

Use Pattern: No Pattern  
 Subject: General Reference, Shop Safety

## General Shop

Newkirk, Louis V. General Shop for Everyone.

Boston: D. C. Heath and Co., 1952.

6-1/2" x 9", cloth bound, pp. 225, ind., ill.

Broad exploratory approach.

Drafting: planning your work, use of drafting equipment, lettering, line techniques, pictorial drawing, working drawings, freehand sketching, geometric construction, surface development, graphs charts, maps tracing, and blueprinting.

Woodworking: lumbering and the woodworking industry, measuring and testing wood surfaces, using woodworking tools, using woodworking machines, squaring a piece of wood stock, common woodworking joints, wood finishing, suggested projects.

Metalwork: metalworking industries, measurement and layout work, using metalworking tools and equipment, soldering, welding, foundry work, machine tools, suggested projects.

Electricity: the age of electricity, magnets, the nature of electricity, electrical wiring, electrical lighting and heating, direct and alternating current, electronics, electrical jobs everyone should know how to do, suggested projects.

Plastics: the plastics industry, working with plastics, suggested projects.

Content: (1) (2) (3) 4 5 (6) (7) (10) 11

Objectives: A (B) (C) (D)

Use Pattern: Industrial Arts (weak)

Subject: General Comprehensive Shop

## Graphic Arts

Gleeson, Glen., and Pitkin, Charles W. General Printing. Bloomington: McKnight and McKnight Publishing Co., 1941.

7-1/2" x 10", paper bound, pp. 160, ind., ill., bibl.

Graphic Arts - Continued.

Information and operation unit approach.

Introduction; hand composition; proofing; platen press work; layouts; display advertising; the printing industry; workers in printing; historical background; modern developments and machinery; how paper is made; and printing inks.

Content: 1 2 3 5 6 7 9 10 11 14

Objectives: (A) B\* (C) D E

Use Pattern: Industrial Arts

Subject: Graphic Arts, Printing, General

Eisenberg, James. Silk Screen Printing. Bloomington: McKnight and McKnight Publishing Co., 1952.

8" x 10", paper bound, pp. 54, ind., ill.

Unit approach: introduction, tools and materials, and procedures.

How to build an inexpensive unit; the squeegee; drying racks; silk screen colors; paper stencil method; the tusche and glue method; reverse color printing using show card mixture; indirect photographic method using gelatin transfer film; the lacquer film stencil method; art work and lettering; and how to make a poster head.

Content: 1 2 3 5 6 7 (8) (9) 10

Objectives: (A) B (D) H

Use Pattern: Industrial Arts and Specialization

Subject: Graphic Arts, Screen printing

Groneman, Chris. General Bookbinding. Bloomington: McKnight and McKnight Publishing Co., 1941, rev. 1946. 7-1/2" x 10", paper bound, pp. 60, ind., ill., bibl.

Project centered.

Brief history of bookbinding; tools and equipment; materials and supplies; memorandum pad; autograph booklet; photo album; photograph folder; binding loose leaves into book form; binding magazines into book form; rebinding an old book; treatment of books; and directions for constructing some of the tools needed.

Content: 1 2 3 4 5 (6) 8 13

Objectives: A B C H

Use Pattern: Crafts

Subject: Graphic Arts, Bookbinding

Hague, C. W. Printing for the Schools. Milwaukee: The Bruce Publishing Co., 1943.

Graphic Arts, Continued.

5½" x 8½", cloth bound, pp. 270, ind., ill., bibl., glossary.

Description and discussion followed by review questions. Types and composing equipment; setting type; handling and tying type forms; proofing and proof reading; cleaning and correcting type forms; distributing type; imposing and locking forms for the press; printing processes; operation of the platen press; paper cutting and bindery work; suggestions for shop practice; display types; selecting type for a job; fundamentals of design; use of borders and ornaments; preparation and use of layouts; typical display forms; composing color forms; tabular composition; printing the school newspaper; linoleum-block printing; silk-screen printing; special operations on the platen press; brief history of printing; how paper is made; kinds and use of paper; printing inks; printing plates; modern print-shop style; and print-shop mathematics.

Content: 1 2 3 4 5 6 7 (8) (9) (10)

Objectives: A B (C) D

Use Pattern: Industrial Arts

Subject: Graphic Arts, General

Hague, C. W. Printing Job Sheets. Milwaukee: The Bruce Publishing Co., 1934.

7½" x 10½", envelope, 15 job sheets, 12 operation sheets, type measurement sheet, and California job case sheet.

Unit approach.

Setting type; removing type from stick and placing on galley; typing type forms; job proofing; marking proofs; correcting type forms; cleaning type forms; distributing type; imposition and lockup; platen press work; and, stock figuring and cutting.

Set No. 2, Advanced Composition: layout; to assemble a type form; skeletonizing forms with borders; and composing register forms.

Content: 2\* 4\* 6

Objectives: A\* B

Use Pattern: No Pattern - Specialization

Subject: Graphic Arts, General Printing

Jahn, Hugo. Hand Composition. New York: John Wiley and Sons, Inc., 1931.

6" x 9", cloth bound, pp. 341, ind., ill., bibl. glossary.

# Graphic Arts - Continued.

Descriptive and discussional approach.

Pre-typographic writing symbols, materials, and books; block-prints and block books; the invention of typography; type cases; compositors' tools; proof presses and how to operate them; the characteristics of printing types; names and sized of types; composition; distribution; printers proof; the point system of measurement; tabular composition; cabinets, stands, racks, and tables; lockup appliances and plate bases; stone work and imposition; book composition; the invention of paper; and, modern manufacture of printing papers.

Content: 1 2 3 5 6 7 9 12

Objectives: B D H

Use Pattern: Specialization

Subject: Graphic Arts, General Printing

Johnson, William H., and Newkirk, Louis V. The Graphic Arts. New York: The Macmillan Co., 1942.

8" x 11", paper bound, pp. 155, ind., ill.; ref. bibl.

Unit approach: discussion, illustrative jobs, procedures, discussion topics, and review questions.

Graphic arts in modern industry; using type; the platen press; some methods of making type; high speed presses; making linoleum engravings; woodcuts; engravings and etching; photo engraving; photo engraving; lithography; silk-screen printing; estimating and cutting paper stock; small duplicators; book making; making a book of several signatures; paper making; photography; and developing and printing.

Content: 1 2 3 4 5\* (6) (8) 9\* 10

Objectives: A (B) (C) D (E)

Use Pattern: Industrial Arts

Subject: Graphic Arts, General

Karch, R. R. How to Recognize Type Faces. Bloomington: McKnight and McKnight Publishing Co., 1952.

5½" x 9", cloth bound, pp. 251, ind.; ill.

A specialized book to enable the user to quickly identify type faces.

Type face classification; families of type; fonts of type; series of type; design as a factor in type size; type in mass; comparative "color" of type; parts of a type face; distinguishing characteristics; factors which make identification difficult; long and short descenders; "fit" of



Graphic Arts - Continued.

italics; effect of gravure screen upon type faces; how to identify the printing process used; and index to types shown.

Content: 3 6\*\*\*

Objectives: 3

Subject: Graphic Arts, Technical Reference (printing)

Kauffmann, Desire. Graphic Arts Crafts. New York: D. Van Nostrand Co., Inc., 1948.

5½" x 8½", cloth bound, pp. 244, tab. cont.

Essay approach. Job centered.

Linoleum block printing; wood-engraving; silk-screen printing; and bookbinding.

Content: 1 2 3 5 (6) 13

Objectives: A (B) (D) H

Use Pattern: Crafts or Avocational

Subject: Graphic Arts, Crafts Processes

Kosloff, Albert. Mitography. Milwaukee: The Bruce Publishing Co., 1952.

6" x 9½", cloth bound, pp. 131, ind., ill.

Discriptive and discussional approach.

History and principles of mitography; basic materials; equipment; screen fabrics; mitographic or screen process printing plates; knife-cut film printing plates; inks; preparation for printing; drying and drying racks; the squeegee; photomitography; photomitographic-film printing plates; photomitographic direct plates; positives for photomitography; the washout printing plate; the block-out mitographic plate; other mitographic printing plates; printing on various surfaces and materials; the industry of mitography.

Content: 1 2 3 4 5 6 7 (8) (9) 10 12 13

Objectives: (A) B\*\* (C) (D) (E) G H

Use Pattern: Industrial Arts and Specialization

Subject: Graphic Arts, Silk Screen

Lush, Clifford K. Junior Printing. Peoria: Charles A. Bennett Co., Inc., 1943.

7½" x 10½", paper bound, pp. 63, tab. cont., ref.

Workbook approach: discussion and description, illustrative jobs - specifications, procedures, references, and tests.



Graphic Arts - Continued.

Introduction; learning the California job case; setting type; straight composition; locking a form; printing papers; presswork.

Content: 1 2 3 4 5 (6) (8) (9) 10 11 14

Objectives: A (B) (C) D E F (I)

Use Pattern: Industrial Arts

Subject: Graphic Arts, General Printing

Marinaccio, Anthony, and Osburn, Burl W.

Exploring the Graphic Arts. Scranton: International Text-book Co., 1942.

6" x 9", cloth bound, pp. 260, ind., ill., bibl.,

Essay or descriptive approach.

Man and his records; letterpress printing; relief cuts for letterpress printing; intaglio printing; planography; other printing processes; paper and paper making; ink and ink making; books, their binding, use, and care; physical plan and equipment for a graphic arts laboratory.

Content: 1 2 3 4 5\* 6 7 8 9\*\* 11 13 14

Objectives: A\* B C D\* (E) F H I

Use Pattern: Industrial Arts

Subject: Graphic Arts, General

The University of the State of New York, State Education Department. Printing Area Related Information  
Industrial Arts Comprehensive General Shop Course.

Albany, New York: Delmar Publishers, Inc., 1952.

7½" x 10½", cloth bound, pp. 120, ind., ill., bibl.

Unit of study or topical approach: the story, references, assignments, and topical tests.

Relationships in the following areas; planning, social-economics, guidance, science, safety and hygiene, and consumer values.

Content: (1) 3 5\*\* (6) 7\* 8\* 9\*\* 11 14

Objectives: (B) C\* D\* E\* F I

Use Pattern: Industrial Arts

Subject: Graphic Arts, Related Information

McCoy, Robert A. Practical Photography. Bloomington: McKnight and McKnight Publishing Co., 1950.

6" x 9", cloth bound, pp. 212, ind., ill., ann. bibl.

Introductory approach.

Graphic Arts - Continued.

The story of photography; choosing a camera; lenses; methods of obtaining correct exposure; films; filters; the dark room; developing the negatives; contact printing; enlarging; treatment of imperfect negatives; special treatments of prints; some principles of art; landscape photography; still life photography; portraiture; silhouettes; motion picture photography; color photography; professional photography; selected references; formulas; recommended exercises.

Content: 1 2 3 4 5 6 7 8 10 (12) 13  
 Objectives: A B C D E (G) H  
 Use Pattern: Industrial Arts  
 Subject: Graphic Arts, Photography

## Handcrafts

Cox, Doris, and Warren, Barbara. Creative Hands. New York: John Wiley and Sons, Inc., 1945, rev. 1951.

7" x 10", cloth bound, pp. 357, ind., ill., annot. bibl. Instructions for the beginner in crafts. Design; color; selective taste; unit designs and repeat methods; dress accessories (finger weaving, card weaving, embroidery); handbags; buttons (leather, wooden, fabric, and metal); mittens and hoods; leather; paint and wood (household accessories); fabrics; decorative needlework (wall hangings, hooked rugs, and applique); practical portfolios; metal, solder, and acid (art metal, etching, pewter serving pieces, table accessories); decorative cookies, foods, and eggs.

Content: 1 2\* 3\* 4 5 (6) 7\* 8 9 13  
 Objectives: A\* H\*  
 Use Pattern: Crafts  
 Subject: Handcrafts, General

Haines, Ray E., ed. The Home Crafts Handbook.

New York: D. Van Nostrand Co., Inc., 1948.

5½" x 8", cloth bound, pp. 990, ind., ill.

A Composite book. Approach varies with each author.

Lathercraft; woodworking crafts; metal art crafts; hand made jewelry; graphic arts; plastic arts; and basketry and related crafts.

Content: 1 2 3 4 5 (6) (7) 13  
 Objectives: A\* (B) H\*

Handcrafts - Continued.

Use Pattern: Crafts  
 Subject: Handcrafts, General

Johnson, William H., and Newkirk, Louis V.  
The Textile Arts. New York: The Macmillan Co., 1944.  
 8" x 11", paper bound, pp. 144, ind., ill., ref.  
 Information unit approach. Discussion, review questions  
 and bibliography.  
 Textile fibers and fabrics; cotton; rope; linen; making  
 meshes; silk; dyeing and printing fabrics; wool; weav-  
 ing at home or in the shop; knitting; fly tying; synthetic  
 fibers; braiding; care of clothing; carpets and rugs.  
 Content: (1) 2 3\* 4 5 6 (7) 8\* (10) 13  
 Objectives: A (B) C (D) (E) H  
 Use Pattern: Industrial Arts  
 Subject: Handcrafts, Textiles

Lee, Martha L. Basketry and Related Arts. New  
 York: D. Van Nostrand Co., Inc., 1948.  
 5½" x 8½", cloth bound, pp. 189, tab. cont., source of  
 materials.  
 Operation unit centered. Projects, tools, materials, and  
 procedures.  
 Basketry; basketry materials and tools; hints and general  
 instructions; wicker weaves; reed borders; projects in reed  
 basket making; cane and its uses; projects in cane weaving;  
 rush and its uses; projects; hong kong grass and its uses;  
 projects.  
 Content: (1) 2 3 4 5 (6) 13  
 Objectives: A (B) H  
 Use Pattern: Crafts or Avocational  
 Subjects: Handcrafts, Basketry

Newkirk, Louis V., and Zutter, Lavada. Your  
 Craft Book. Scranton: International Textbook Co., 1946.  
 8½" x 11", cloth bound, pp. 209, tab. cont., ill., patterns  
 and proj.  
 Project centered. Elementary and intermediate grades.  
 Projects in paper, wood, textiles, clay, plastics, cork,  
 bead work, plaster, native materials, and miscellaneous.  
 Patterns, illustrations, materials and tools, and general  
 directions.

Handcrafts - Continued.

Content: (1) 2 (3) 4\* (5) (6) (7) 13  
 Objectives: A\* H\*  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, General

Newkirk, Louis V., and Zutter, Lavada. Crafts For Everyone. Scranton: International Textbook Co., 1950. 8" x 10 $\frac{1}{2}$ ", cloth bound, pp. 209, tab. cont., ref. source of supplies.

Project centered instructions: drawings, introductory statement, tools needed, materials needed, and operations to be performed.

Wood craft; metal craft; leather craft; plastic craft; applied designs ( shell jewelry, feather jewelry, wood novelties, tree ornaments, pine garlands and wreaths, etching glass, decorated jars, and pressed flowers ); textile arts; paper crafts.

Content: (1) 2 (3) 4\* (5) (6) (7) 13  
 Objectives: A\* (B) H\*  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, General

Waltner, Elma. Carving Animal Caricatures. Bloomington: McKnight and McKnight Publishing Co., 1951.

7 $\frac{1}{2}$ " x 10", paper bound, pp. 103, tab. cont., ill., proj. 24. Project centered.

Woods for carving; tools for carving; procedures for making projects.

Content: 1 2\* (3) 7 13\*  
 Objectives: A H\*  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, Wood Carving.

Martin, Charles, and D'Amico, Victor. How To Make Modern Jewelry. The Museum of Modern Art. Scranton: International Textbook Co., 1949.

7 $\frac{1}{2}$ " x 10", cloth bound, pp. 96, tab. cont., ill., bibl. proj. 18.

Progressive project centered. Creative design emphasis. Introduction; art for beginners series; ordering sterling silver; where to buy materials and tools; basic tools used in jewelry making; tools and supplies for making jewelry in this book; projects illustrating jewelry making processes;

Handcrafts - Continued.

and instructions for making jeweler's workbench.

Content: 1 2 3 4 5 6 7 (10) 12 13

Objectives: A B H

Use Pattern: Crafts or Avocational

Subject: Handcrafts, Art Metal, Jewelry Making

Osburn, Burl N. Pewter: Spun, Wrought, and

Cast. Scranton: International Textbook Co., 1938.

7½" x 11", cloth bound, pp. 148, ind., ill., bibl.

Essay approach.

The story of pewter; the metal; designing pewter ware; layout and forming; soldering; plaster casting; beating down and planishing; raising; decorative processes; casting; spinning low forms; spinning high forms; appendices ( bibliography, museum collections, supply sources, sizes and weights of materials ).

Content: (1) 2 3 4 5 6 7 9

Objectives: A B (D) (H)

Use Pattern: Crafts or Non-Directed.

Subject: Handcrafts, Art Metals

Pack, Greta. Jewelry and Enameling. New York:

D. Van Nostrand Co., 1941.

5½" x 8½", cloth bound, pp. 372, ind., ill., bibl., glossary, cr.

Work manual approach: information, tools, materials and procedures.

Working processes: annealing, pickling, filing,

Construction processes: sawing, piercing, soldering, casting, cleaning, polishing, and coloring. Decorative processes:

chasing, repousse, modeling, carving, wire working ( drawing, twisting, waving, coiling ), domes, balls, stamped forms, enameling, and stone setting. Jewelry making: finger rings, broaches, clips, bracelets, chains, clasps, and beads, Stones: hardness, translucent, opaque, and transparent.

Appendices: solders and fluxes, cleaning materials and solutions, preparation and care of materials and tools, wire gauge standards, workshop floorplan, and equipment.

Content: (1) 2\*\* 3 (4) 5 6\* 7 (10) 12 13

Objectives: A\* B\* D G H

Use Pattern: Crafts and Specialization

Subject: Handcrafts, Art Metal, Jewelry Making



# Handcrafts - Continued.

Smith, Robert E. Etching, Spinning, Raising, and Tooling Metal. Bloomington: McKnight and McKnight Publishing Co., 1951.

7-1/2" x 10", paper bound, pp. 84, ind., ill., bibl., proj. 25. Instruction and operation unit approach.

Safety; commonly used metals; piercing; overlaying; tooling; forming and raising; metal spinning; fitting appendages; coloring and oxidizing; etching; cleaning; electroplating; abrasives; painting metals.

Content: 1 2 3 4 5 6 7 11

Objectives: A\* B (D) H\*

Use Pattern: Crafts or Avocational

Subject: Handcrafts, Art Metal

Winebrenner, D. Kenneth. Jewelry Making as an Art Expression. Scranton: International Textbook Co., 1953.

7-1/2" x 10", cloth bound, pp. 181, ind., ill., ann. bibl. Creative approach.

Finding a way to be an individual; Part One: getting started - sound design and good workmanship, experiments and explorations in materials and processes to discover limitations and possibilities in design, deciding what to do and how to do it, 24 experimental approaches adapted to the beginner in design, collecting materials and tools for the job, setting up a shop at school or at home (suggestions for various ages and situations). Part Two: exploring processes - an illustrated dictionary of processes for informal class use, less common processes, sources of supply.

Content: 1 2\* 3 4 5\* 6\* 7\*\* (8) 9\*\* (10) 13\*\* 14\*

Objectives: A\*\* B\* (C) D H I\*\*

Use Pattern: Industrial Arts and Fine Arts

Subject: Handcrafts, Art Metal, Jewelry Making

Wiener, Louis. Hand Made Jewelry. New York: D. Van Nostrand Co., Inc., 1948.

5-1/2" x 8-1/2", cloth bound, pp. 244, tab. cont., ill. Essay approach. Operation centered.

The jeweler's saw; transferring the design to the metal; files; filing and abrasive tools; soft-soldering; hard-soldering; pickling; pickling solution; annealing; buffing; polishing; lacquering; dips and oxidizing or coloring solutions; domes and shots; chasing and repousse; using



### Handcrafts - Continued

miscellaneous small tools; casting jewelry; stone setting; wire working; miscellaneous construction; and the procurement of supplies.

Content: 1 2\* 3 (4) 5 (6) (8) 13  
 Objectives: A B H  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, Art Metal, Jewelry Making

Cherry, Raymond. General Leathercraft. Bloomington: McKnight and McKnight Publishing Co., 1940, rev. 1946, 1949.

7-1/2" x 10", paper bound, pp. 125, ind., ill., ref., proj. 35.  
 Operation sheet approach: project centered, introduction, specifications, tools and materials, and procedures.  
 Related information; fundamental operations; designs.

Content: 1\* 2\* 3\* 4\* 5\* 6 7 13  
 Objectives: A\* (B) (C) (D) H\*  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, Leathercraft

Dean, John W. Leathercraft, Techniques and Designs. Bloomington: McKnight and McKnight Publishing Co., 1950.

6-1/2" x 10", cloth bound, pp. 245, ind., ill., proj. 50.  
 Information, operation, and project centered.  
 Introduction; leathers and tannages; tools and equipment; processes; leather designs and patterns; mass producing leather products; and how to make special tools for special jobs.

Content: 1\*\* 2\* 3\* 4\* 5 6\* 7\* 8 13  
 Objectives: A\*\* B\* (C) (D) H\*\*  
 Use Pattern: Crafts and Specialization

Groneman, Chris. Leather Tooling and Carving. Scranton: International Textbook Co., 1950.

8" x 10-1/2", cloth bound, pp. 108, ind., ill., bibl., proj. 40.  
 Unit approach. Project centered.  
 The various types of leathers; tools and equipment; cutting leather; preparing leather; transferring designs; tooling and carving; cutting edge lacing; lacing edges; fastening methods; making a round strap handle; making a loop; making folds in heavy leather; finishing procedures; and making

Handcrafts - Continued.

a holster pattern.

Content: 1 2\* 3\* 4\* 5 6 7 (8) 13  
 Objectives: A (B) (C) (D) H  
 Use Pattern: Crafts or Avocation  
 Subject: Handcrafts, Leathercraft

Mannel, Elise. Leathercraft is Fun. Milwaukee:  
 The Bruce Publishing Co., 1952.

6" x 9", cloth bound, pp. 92, tab. cont., ill. proj. 27.  
 Projects and related information.  
 Introduction; tools you will need; buying leather; steps  
 in leather-craft; methods of lacing; letters for tooling.  
 Inexpensive projects.

Content: (1) 2\* 3 4\*\* 5 7 13  
 Objectives: A\*\* H\*  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, Leathercraft

Thompson, Robert L. Leathercraft. New York:  
 D. Van Nostrand Co., Inc., 1948.

5½" x 8½", cloth bound, pp. 137, tab. cont., ill.  
 Job sheet approach. Project centered. Psychological  
 arrangement.  
 How to make: a leather bookmark, key case, billfold or  
 wallet, stained leather bookends, blotter corners, purses  
 and handbags, carved leather knife sheath, braided and link  
 belts, and braided lanyard.

Content: 2 4 5 (7)  
 Objectives: A H  
 Use Pattern: Crafts  
 Subject: Handcrafts, Leathercraft

Woolf, Natalie S. Glovemaking for Beginners. Bloom-  
 ington: McKnight and McKnight Publishing Co., 1951.

7½" x 10½", paper bound, pp. 99, ind., ill.  
 Operation centered.  
 Tools and equipment; tanning of leathers for gloves; glove  
 leathers; procedures in making custom gloves; measuring;  
 layout; sewing; special stitching design; laced designs;  
 binding; making buttonholes; attaching buttons; snaps;  
 lined gloves; washing; pressing; top designs; finished  
 gloves; full-size patterns.

Handcrafts - Continued.

Content: 1 2 3 4 5 6 7 8 12 13  
 Objectives: B C G H\*  
 Use Pattern: Industrial Arts and Specialization  
 Subject: Handcrafts, Leathercraft, Glovemaking

Cherry, Raymone. Carved Billfold Designs.  
 Bloomington: McKnight and McKnight Publishing Co., 1951.  
 Plates 7" x 10", paper bound, 15 project designs.  
 Actual size designs, photographs, suggested stamp numbers.  
 Content: 4  
 Subject: Handcrafts, Leathercraft, Projects

Dean, John W. 107 Leathercraft Designs in Actual Size.  
 Bloomington: McKnight and McKnight Publishing Co., 1950.  
 Plates 10" x 14", paper bound, folded 7-1/2" x 10".  
 Content: 4\*  
 Subject: Handcrafts, Leathercraft, Projects.

Groneman, Chris. Leather Tooling and Carving Patterns.  
 Scranton: International Textbook Co., 1950.  
 Full size patterns taken from Leather Tooling and Carving, 17" x 22" plates. Projects 40. Construction and dimension notes and tracing paper included.  
 Content: 4  
 Subject: Handcrafts, Leathercrafts, Projects.

Adams, John V. Plastic Arts Craft. New York:  
 D. Van Nostrand Co., Inc., 1948.  
 5-1/2" x 8-1/2", cloth bound, pp. 130, tab. cont., ill.  
 Project centered.  
 What are plastics; plastics used in crafts work; sources of materials and supplies; how to work with plastics; plastic paper knife; plastic bracelet; plastic powder box; some advanced techniques; typical projects; chart of plastic characteristics.  
 Content: 1 2 3 4 5 (7) (11) 13  
 Objectives: A B (D) (F) H  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, Plastics

Cherry, Raymond. General Plastics, Projects, and

# Handcrafts - Continued.

Procedures. Bloomington: McKnight and McKnight Publishing Co., 1941, rev. 1947, 1948.  
 7-1/2" x 10", paper bound, pp. 151, ind., ill., bibl.proj.49.  
 Operation sheet approach: projects, discussion, description, photographs, specifications, working drawings, and procedures.  
 Hand tool operations; machine tool operations; related information; and references.  
 Content: (1) 2\* 3 4\* 5 6 7 (8) 13  
 Objectives: A\* B (D) H\*  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, Plastics

DeWick, Earnest, and Cooper, John H. Plastic Craft. New York: The Macmillan Co., 1946.  
 8" x 11", cloth bound, pp. 184, tab. cont., proj. 68, sources of supply.  
 Plastics: what they are; suitability for home and school use, versatility, potentialities, design, color, using plastics in the art studio; etching on plastics, etching with plastics, tempera painting on plastics, and lettering.  
 Operations: layout, sawing, filing, drilling, threading, and tapping, sanding, turning, grooving, routing, shaping, planing, cleaning, ashing, polishing, buffing, cementing, forming, fastening devices, joints, pressure methods, inlaying, jigs and fixtures, and dip-dyeing;  
 Content: 2\* 3\* 4\* 5 6 7 (8) (9) 13  
 Objectives: A\* B D H  
 Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, Plastics

Groneman, Chris. Plastics Made Practical. Milwaukee: The Bruce Publishing Co., 1948.  
 6" x 9-1/2", cloth bound, pp. 319, ind., ill., proj. 100, bibl., sources of supply. Working drawing, bill of materials, and procedure.  
 History and development; definition; types; methods of forming; characteristics; use; illumination; sources and how to buy; cements; dyes; accessories; essential tools and equipment; transferring patterns; sawing; dressing edges and surfaces; turning; drilling holes; tapping and threading; forming; fastening; surface decoration; cleaning and coloring.  
 Content: 1 2\* 3\* 4\* 5\* 6 7 9 13  
 Objectives: A\* B D H\*

Handcrafts - Continued.

Use Pattern: Crafts or Avocational  
 Subject: Handcrafts, Plastics

Lockery, A. J. Plastics in the School and Home Workshop. New York: D. Van Nostrand Co., Inc., 1940  
 rev. 1946.

6" x 9", cloth bound, pp. 230, ind., ill.,  
 Essay approach. Information centered.  
 Plastics - a new crafts material; equipment required;  
 machining operations; carving; cementing; bending; embossing;  
 inlaying; finishing; commercial processes; acrylic resins;  
 slush molding; rubber molds; acetates; projects in acetate;  
 hand tool projects in cast resin; power-tool projects;  
 forty projects in lucite-plexiglass; findings and supplies;  
 research; unusual uses; the future of plastics; and sources  
 of supply.

Content: 1 2 3 4 5 6 (8) (9) (10) 13

Objectives: A B D H

Use Pattern: Crafts or Avocational

Subject: Handcrafts, Plastics

Robinson, Clark N. Meet the Plastics. New York:  
 The Macmillan Co., 1949.

6" x 9½", cloth bound, pp. 168, ind., ill., bibl., manufact-  
 urers, classification by trade names, institutions offering  
 courses in plastics.

Subject; and information centered. Non-technical approach.  
 Introduction; plastic materials; plastic ingredients; mold-  
 ing; extruding and casting; laminates; adhesives; coatings;  
 fibers; the plastic industry; the plastics research lab-  
 oratory; molding plants and fabricating plants; plastics  
 as handcrafts materials; opportunities in the plastics in-  
 dustry; and the consumer and plastics.

Content: (1) 2\* 3\*\* 5\*\* 6\* 8 9 10 12 13

Objectives: B\* C D\* E\* G H

Use Pattern: Industrial Arts and Specialization

Subject: Handcrafts, Plastics

## Home Mechanics

Di Bernardo, D. Joseph. Making Your Home Fur-  
 nishings. New York: D. Van Nostrand Co., Inc., 1952.



# Home Mechanics - Continued.

6" x 9", cloth bound, pp. 233, ind., ill.

Operation units.

Upholstering and reupholstering; finishing and refinishing; furniture; judging and selecting fabrics; making and using slip covers; making and using draperies; use and combination of period furniture; fabrics; walls; colors; and woods.

Content: 1 2\* 3 4 6\* 7\* 8\*

Objectives: A B C G\*

Use Pattern: Specialization

Subject: Home Mechanics, Interior Decorating

Johnson, William H., and Newkirk, Louis V. Home Mechanics. New York: The Macmillan Co., 1947.

8" x 11", cloth bound, pp. 298, ind., ill.

Unit approach. Review questions.

Electricity in the home; the care and repair of home utensils and appliances; plumbing and heating; windows and doors; home and garden.

Content: (1) 2 (3) 4 5 (6) (7) 8 11

Objectives: A (B) C (D) G

Use Pattern: Industrial Arts

Subject: Home Mechanics

Schaeffer, Carl J. Home Mechanics For the General Shop. Milwaukee: The Bruce Publishing Co., 1950.

6" x 9", cloth bound, pp. 141, ind., ill., bibl.

Information and illustrative projects: study section, problem, tools and materials, procedures, and review questions. Doors; windows; storm windows and screens; plaster patching; paints and painting; wall paper; floors; hot water systems and plumbing; roofs insulation; concrete and mortar; electricity; and furniture repair.

Content: 1 2 3 4 5 6 8 11

Objectives: A B C

Use Pattern: Crafts

Subject: Home Mechanics

Woodin, J. C. Home Mechanics. Bloomington: McKnight and McKnight Publishing Co., 1949.

7-1/2" x 10", paper bound, pp. 102, ind., ill.



## Home Mechanics - Continued

Unit organization: objectives, general information, procedures, and suggested activities.

Working drawings; sharpening kitchen knives; re-gluing furniture; applying paint, enamel, and varnish; cleaning paint brushes; finishing and re-finishing furniture; household upholstery; care and upkeep of hardwood floors; care of linoleum; plaster patching; repair of door and window screens; door locks and hinges; window shades; electric service with safety; reading meters; repair of electrical cords; care and upkeep of household motors; electrical trouble shooting; the electric iron; vacuum cleaner; the electric range; the gas stove; sanitation of bathroom and kitchen; the hot water system; care and upkeep of plumbing; care of silver ware; the evolution of artificial lighting; and lighting the home.

Content: (1) 2 3 4 5 (6) 7 8\* 11

Objectives: A C\* (D) F

Use Pattern: Crafts

Subject: Home Mechanics

## Mechanical Drawing

Berg, Edward. Mechanical Drawing. Book I, Book II.

Milwaukee: The Bruce Publishing Co., 1942, Rev. 1948.

7" x 10", paper bound, ind., ill., append., Bk I-pp. 120,

Bk II pp. 87.

Instructional unit plan.

Book I - Definition and use of mechanical drawing; materials and instruments and their use; graphic construction; American standard projection; lettering; lines and line work; dimensions and notes; working drawings; projection aids; sections; auxiliary views; appendix of useful information and extra problems.

Book II - Introduction; pattern development; pictorial drawing; architectural drawing; machine drawing; appendix of useful information and extra problems.

Content: 1\* 2\* 3 4 5 6\* (8) (9) (12)

Objectives: A\* B\* D G

Use Pattern: Specialization

Subject: Drawing, General Mechanical

Mechanical Drawing - Continued

~~Ermeling~~, Williard W., Fischer, F. A. P., and Green, George G. Mechanical Drawing. First Year, Second Year. Milwaukee: The Bruce Publishing Co., 1921, Rev. 1922, 1924.

8" x 6", paper bound, tablet opening, ind. ill.

First Year - pp. 80. Second Year - pp. 120.

Instruction unit organization.

First Year - (two semesters) - First semester - Orthographic projection; second semester - Isometric drawing. Course outline; materials and tools; lettering; definition of terms; introduction to orthographic projection; inking; dimensioning; geometric constructions; isometrics; sections; auxiliary planes; developments; and freehand sketching;

Second year - revolutions of solids; intersections of solids; developments; sheet metal drawings; fundamentals of machine drafting - threads, the helix, application of set screws, rivets and fastenings, finish, tolerance, taper and taper pins; classes of machine drawings; tracing and blue-printing; architectural drawing - lettering, window and door details, materials and specifications.

Content: 1 2 3 4 5 6

Objectives: A B

Use Pattern: Specialization

Subject: Drawing, General Mechanical

~~Fleming~~, Joseph W., Barich, Dewey F., and Smith, Leonard C. Applied Drawing and Sketching. Chicago: American Technical Society, 1950.

8 $\frac{1}{2}$ " x 10 $\frac{1}{2}$ ", paper bound, tab. cont., ill.

Instructional unit organization. Workbook approach.

Development of the principles of drawing as a language through sketching and reading drawings. Descriptive material, illustrations, applications and questions for review.

Where drawings can be used; reading drawings; making pictorial drawings; lettering; working drawings; graphs; maps; reading machine shop blueprints; reading trade blueprints; and planning.

No instruments or special equipment required.

Content: (1) 2\* 3 4\* 5\* 6 7 8 9 (10)

Objectives: A B C\* D\*

Use Pattern: Industrial Arts

Subject: Drawing, Sketching

# Mechanical Drawing - Continued

-Fryklund, Verne C., and Kepler, Frank R. General Drafting. Bloomington: McKnight and McKnight Publishing Co., 1938, Rev. 1949.

7 $\frac{1}{2}$ " x 10", paper bound, pp. 161, ind., ill., bibl.

Instruction unit organization.

Elements and techniques of shape and size description; lettering; inking etc.; sketching; general mechanical drawing; use and care of instruments; geometric constructions; pictorial drawings; development of sheet metal patterns; electrical drawings; tracings; blueprint making; graphs and charts mapping; and architectural drawing. Each unit gives detailed instructions and problems illustrating each fundamental. Review questions provided.

Content: 1\* 2\* 3\* 4 5\* 6\* 7\* 8\* 9\* 10\* 12 13

14

Objectives: A B C D\* E G I

Use Pattern: Industrial Arts and Specialization

Subject: Drawing, General Mechanical

-Green, Daniel. Drawing for Life and Industry.

Milwaukee: The Bruce Publishing Co., 1945.

7 $\frac{1}{2}$ " x 10", paper bound, pp. 175, ind., ill., bibl.

Instruction unit organization. Related to other subjects in the curriculum. A general education approach to drawing.

Drawing in the American way of life; the social and economic background of drawing; the ingredients of drawing; showing how things look by pictorial drawings; sketching; planning to make something; learning, organizing and explaining through drawings; planning to build or remodel a home; simple maps; and duplicating.

Content: 1\* 2\* 3 4\* 5\* 6\* 7\* 8\* 9\* (10) 14\*

Objectives: A\* B C\* D\* E H I

Use Pattern: Industrial Arts

Subject: Drawing, General Mechanical

-Hale, E. M., McGinnis, Harry, and Hill, Carl L. Introduction to Applied Drawing. Bloomington: McKnight and McKnight Publishing Co., 1952.

6" x 9", paper bound, pp. 79, tab. cont., ill.

Exercises and problems. General directions for drawing exercises, plates, and review questions.

Sketching: isometric to orthographic, orthographic to

### Mechanical Drawing - Continued

isometric; use of mechanical aids: horizontal and vertical lines, oblique lines, inclined surfaces, circles and arcs, tangents; drawing to scale; sections; freehand orthographic sketching; reading and interpreting drawings; graphs; developments; electrical layouts. Problems related to actual objects.

Content: 2 4 5 (6)  
 Objectives: A B D  
 Use Pattern: Specialization.  
 Subject: Drawing, General Mechanical

#### -Jervis, William. General Mechanical Drawing.

Scranton: International Textbook Co., 1950.

6" x 9", cloth bound, pp. 285, ind., ill.

Instruction unit organization, psychological approach: Objectives, discussion followed by problems, questions, and projects.

Scale drawing; styles of lettering; floor plans; maps and topographic drawings; graphs; orthographic projection; working drawings; assembly drawings; pictorial drawings; developments; geometry; mechanical drawing.

Content: 1 2 (3) 4\* 5\* 6\* 7\* 8 9\* (14)  
 Objectives: A\* B C D (I)  
 Use Pattern: Industrial Arts  
 Subject: Drawing, General Mechanical

#### -Johnson, William H., and Newkirk, Louis V. Modern Drafting. New York: The Macmillan Co., 1944.

8" x 11", cloth bound, pp. 194, ind., ill., ref., bibl.

Instruction unit organization: description, discussion, summary, and questions for review.

The Draftsman's language and tools; lettering and techniques; reading drawings; working drawings; pictorial drawings; and freehand sketching; geometric constructions; sheet metal drafting and surface development; machine drafting; aircraft drafting; architectural drafting; graphs and maps; tracings, blueprinting and duplicating.

Content: 1 2 (3) 4 5\* (6) (8) 9 (10)  
 Objectives: A (B) (C) D  
 Use Pattern: Industrial Arts (weak)  
 Subject: Drawing, General Mechanical

### Mechanical Drawing - Continued

—Klenke, William W., and Hayes, Charles J.  
Elementary Mechanical Drawing. Scranton:  
 International Textbook Co., 1940.  
 6" x 9", cloth bound, pp. 238, ind., ill., glossary.  
 Instruction unit organization: related information course  
 outlines for two semesters work, and questions.  
 Introduction; orthographic projection; method for  
 dimensioning; working drawings; sectional views; turned ob-  
 jects; drawing to scale; pictorial drawing; care of instru-  
 ments and equipment; technical and freehand drawing.  
 Second term - Introduction; revolutions; auxiliary planes.  
 Content: 1\* 2\* 3 4 5 6\* 7 (9) (12)  
 Objectives: A\* B\* (D) (G)  
 Use Pattern: Specialization  
 Subject: Drawing, General Mechanical

—Klenke, William W., and Hayes, Charles J. Advanced  
Mechanical Drawing. Scranton: International Textbook Co.,  
 1941.  
 6" x 9", cloth bound, pp. 300, ind., ill., glossary.  
 Instruction unit organization. 2nd of two book series.  
 Features correlation of drawing and mathematics.  
 Third Term: development of surfaces, triangulation, inter-  
 secting objects; exercises in mathematical calculations.  
 Fourth Term: Fastening used for machinery; various screws;  
 bolts; locking devices; keys; rivets; tracing and inking;  
 accuracy, tolerance, and measurements; line shading,  
 reducing, and enlarging; architectural drawing; elements of  
 perspective; photo-copying of drawings; drafting room equip-  
 ment.  
 Content: 1 2\* 3 4 5\* 6\* 7 (8) (9) 12  
 Objectives: A\* B\* (C) D G  
 Use Pattern: Specialization.  
 Subject: Drawing, General Mechanical (Advanced)

—McGee, R. A., and Sturtevant, W. W. General  
Mechanical Drawing. Milwaukee: The Bruce Publishing Co.,  
 1930, rev. 1935.  
 6" x 9", cloth bound, pp. 192, ind., ill.  
 Instruction unit organization. Three level of difficulty  
 provided through graded plates.  
 Orthographic and instrument drawing; pictorial mechanical  
 drawing; free-hand sketching; machine drawing; surface  
 development and sheet metal drawing; structural steel drawing;  
 reinforced concrete; principles of design; furniture drawing;



Mechanical Drawing - Continued

architectural drawing; map drawing; electrical drawing; statistical charts, graphs, and diagrams.

Content: 1 2 3 4 5 6 7 8 9 10\* 14  
 Objectives: A\* B C D\* E  
 Use Pattern: Industrial Arts  
 Subject: Drawing, General Mechanical

—Rotmans, Elmer A. Drafting Simplified. Albany, New York: Delmar Publishers, Inc., 1950.

8" x 10 $\frac{1}{2}$ ", cloth bound, pp. 391, ind., ill.

Instruction sheet approach. Progressive series. Workbooks are available to accompany text with partial layout of problems.

Introduction; the tools of drafting; layout of standard sheets; lettering; two-view working drawings sections; auxiliary views; revolutions of solids; screw threads, bolts and screws; working drawings (machine details); geometric constructions; developments and intersections; developments by triangulation; isometric drawings; oblique drawing; perspective; sketching; tables of technical information.

Content: 1\* 2\* 3 4\* 5 6\* 7 (9) 12  
 Objectives: A\* B\* D G  
 Use Pattern: Specialization  
 Subject: Drawing, General Mechanical

—Shaeffer, Glenn N. Basic Mechanical Drawing. Milwaukee: The Bruce Publishing Co., 1946.

6 $\frac{1}{2}$ " x 10", paper bound, pp. 88, ind.

Skills development. An introductory treatment of general drawing through sketching practice over a special guide sheet. A supplementary problem and instruction book.

Layout of sheet; lettering; lines and other conventions of drawing; size description; drawing for reproduction.

Content: (1) (2) 4 (6)  
 Objectives: A (B)  
 Use Pattern: No pattern  
 Subject: Drawing, General Mechanical.

—Williams, E. L. and Spencer, H. C. Technical Drawing For High Schools. New York: The Macmillan Co., 1934, 1935.

9" x 11", paper bound, referenced  
 Workbook approach.



### Mechanical Drawing - Continued

Contain course organization, references, paper, general directions, unit objectives, and problems.

Workbook I - Freehand sketches from objects; lettering; sketches from pictorial drawings; freehand completion problems; instrument practice; working drawings with instruments from sketches; working drawings from dimensioned pictorial drawings; mechanical completion problems; tracing and inking.

Workbook II - Geometrical construction; sectioning; auxiliary views; pictorial drawings (isometric and oblique); scale problems; general working drawings; tracings.

Content: 4\*

Subject: Drawing, General Mechanical

• Lightle, Paul R. Blueprint Reading and Sketching.  
Bloomington: McKnight and McKnight Publishing Co., 1950.  
7" x 10", paper bound, pp. 71.

Workbook. Psychological approach to subject matter.

Introduction, written aids, related information, and problems related to life and industry.

Simple mechanical drawing; woodworking; sections; assembly drawings; radio; architectural; working limits; tolerance; inspection; sheet metal; and sketching from pictorial drawings. Answer sheet available.

Content: 2 4 5 6\* 9 10

Objectives: A B\* C D\* E G

Use Pattern: Specialization

Subject: Drawing and Blueprint Reading

—Olive, C. Thomas, and Payne, Albert V. Basic  
Blueprint Reading and Sketching. Albany, New York:  
Delmar Publishers, Inc., 1952.

8" x 10", paper bound, pp. 139, ind., ill.

Workbook. Instruction units. descriptions and discussion, illustrations, and questions.

Section one develops theory.

Section two develops sketching technique and applications in the following areas: Orthographic, oblique, isometric, and perspective.

Illustrative blueprints are from engineering drawings.

Introduction; lines; views; dimensions and notes; sections; and shop sketching.

Content: 2\* 3 4\* 5 6\* 9 12\*

Objectives: A B D G

Mechanical Drawing - Continued

Use Pattern: Specialization  
 Subject: Drawing, Blueprint reading and sketching.

Steinike, Otto A. Blueprint Reading, Checking and Testing. Bloomington: McKnight and McKnight Publishing Co., 1941, rev. 1945.

Instruction book - 5" x 8", paper bound, pp. 61.  
 Plates - 7 $\frac{1}{2}$ " x 10", 39 plates, dimensioned pictorial drawings and accompanying working drawings, with spaces for dimensions and notes to be inserted.

Instruction book contains information, questions, supplementary references and pertinent technical information.

Content: 4 6

Objectives: B

Subject: Drawing, Blueprint reading.

Norling, Earnest. Perspective Made Easy. New York: The Macmillan Co., 1939.

5 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ ", cloth bound, pp. 203, tab. cont.

Lecture approach.

An easily understood principle and technique of perspective.

Suitable for use by artist, freehand draftsman, etc.

Content: 5 6 7 9\*\* 12 13

Objectives: B\*\*

Use Pattern: No pattern

Subject: Drawing, reference, architectural and free-hand perspective.

Metalwork

Feirer, John L. Modern Metalcraft. Peoria: Charles A. Bennett Co., Inc., 1946.

5 $\frac{1}{2}$ " x 8 $\frac{1}{2}$ ", cloth bound, pp. 280, ind., ill., proj. 35.

Unit approach, project centered: projects, drawings and photographs, materials, procedure, tools, general and technical information. Introduction; measuring stock; transferring designs; cutting with hand tools; drilling and punching holes; cutting with the cold chisel; piercing; filing; bending sheet metal; bending heavy metal; twisting metal; cleaning metal with chemicals; tapping; chasing; etching; plating; making seams; riveting; soft-soldering; hard soldering; overlaying; cutting threads; buffing and polishing; coloring metal; finishing.

### Metalwork - Continued

Content: 1 2 3 4 5 6 (7)  
 Objectives: A B (D)(H)  
 Use Pattern: Crafts or Avocational  
 Subject: Metalwork, General

Johnson, William H., and Newkirk, Louis V. Metal Crafts. New York: The Macmillan Co., 1942.  
 8" x 11", paper bound, pp. 150, ind., ill., ref.  
 Unit approach: information, procedures, projects, summary, questions for review, and discussion topics.  
 Metals in our modern world; working with metal; making iron and steel; working in the foundry; using sheet metal; art metal; metal spinning.

Content: (1) 2 3 4 5 (6)(7)(9)(10)(11)  
 Objectives: A (B)(C)(D)(E)(F)(H)  
 Use Pattern: Industrial Arts  
 Subject: Metalwork, General Bench

Miller, John G. Metal Arts Crafts. New York: D. Van Nostrand Co., Inc., 1948.  
 5½" x 8¼", cloth bound, pp. 165, tab. cont., ill., proj. 17.  
 Units organized around jobs: projects, drawings, pictures of finished projects, and procedures.  
 Metalcraft materials and supplies; tools used in metalcrafts; operations and processes. Elementary sheet metal, bench metals, and art metals.

Content: 1 2 3 4 5 (6)  
 Objectives: A\* B (D) H  
 Use Pattern: Crafts  
 Subject: Metalwork, General Bench

### General Metals

Feirer, John L. General Metals, McGraw-Hill Publications in Industrial Arts, New York: McGraw-Hill Book Co., Inc. 1952.  
 6" x 9", cloth bound, pp. 246, ind., ill., proj. 46, list of visual aids.

Unit approach: introduction, description and discussion topics. Introduction to metals, safety, design, reading drawings, measuring and layout ; bench metals and wrought iron; sheet metal; art metals and jewelry; forging; heat

General Metals - Continued

treating; foundry; welding (gas and arc); machine shop (lathe and shaper). Related information on manufacture and use of metals.

Content: 1 2 3 4 5 6 7 8 9 (10) 11 (13) 14  
 Objectives: A B C D (E)(H) I  
 Use Pattern: Industrial Arts  
 Subject: Metals, General

Ludwig, Oswald A. Metalwork, Technology and Practice. Bloomington: McKnight and McKnight Publishing Co., 1943, rev. 1947.

7½" x 10", cloth bound, pp. 378, ind., ill., coordinated with other subject areas.

Unit approach: definition of unit, discussion, technical information, practice, review questions and new words defined.

Introduction; planning; bench work and power saw; getting acquainted with metals; care of equipment; drill press work; threads, dies, and taps; fitting and assembling; work with sheet metal; heating metal (soldering, brazing, welding, molding and casting); tool sharpening; finishing and inspecting; machine tools (lathe, metal spinning, shaper, planer, milling machine and universal grinder); tables of useful technical information.

Content: 1\*(2) 3\* 5\*\* 6 7 8 9\* 10\* 11\* 14\*  
 Objectives: (A) B\* C\* D\*\*E\*\* I  
 Use Pattern: Industrial Arts  
 Subject: Metalwork, General

Toliver, R. R. Care and Use of Hand Tools. New York: John Wiley and Sons, Inc., 1944.

5½" x 8½", paper bound, pp. 89, ind., ill.

Subject centered: types, sizes, and how to use tools safely. Demonstration and discussion guide for demonstrations of the use of hand tools. Introduction; vices; hammers; cold chisels; files; screw drivers; hack saws; pliers and nippers; wrenches; torque wrenches; machine screw taps; drilling; general reaming practices; measuring tools; micrometers.

Content: 1\* 2\*  
 Objectives: B\* F G\*  
 Use Pattern: Specialized Reference  
 Subject: Metalwork, handtools (reference)

### General Metals - Continued

The University of New York, The State Education Department. Metals Area Related Information Industrial Arts Comprehensive General Shop Course. Albany: The University of New York, 1951.

Distributed by Delmar Publishers.

7-1/2" x 10-1/2", cloth bound, pp. 136, ind., ill., bibliography.

Unit of study or topical approach: The story, objectives, references, assignments and topical tests.

Relationships developed in the following areas: planning, social-economics, guidance, science, safety and hygiene, and consumer values. To be used as presented or as a study guide. Bibliography of references, books, films, magazines, periodicals, manuals, pamphlets, and bulletins.

Content: (1) 3 5\*(6) 7\* 8\* 9\* 11 14

Objectives: (B) C\* D\* E\* I

Use Pattern: Industrial Arts

Subject: Metals, General

### Bench Metals

Barich, Dewey, and Smith, Leonard C. Metal Work for Industrial Arts Shops. Chicago: American Technical Society, 1952.

8" x 11", paper bound, pp. 96, tab. cont., ill.

Information and operation unit organization. Related information units give discussion and descriptions, summary points, discussion topics, and review questions. Materials for operations include drawings, notes, descriptions, and illustrations of operations.

The iron and steel industry; occupations in the iron and steel industry; planning projects; materials; measuring; layout work; designing projects; cutting metal; shaping and forming; decorating metal; fastening metals; cleaning, finishing and preserving metals. Hand processes in bench and art metals areas.

Content: 1 2 3 5\* 6 7\*(8) 9 (10) 11 14

Objectives: (A) B D\* E F (H) I

Use Pattern: Industrial Arts

Subject: Metalworking, General bench

Dragoe, A. W., and Reed, H. O. General Shop Metalwork. Bloomington: McKnight and McKnight Publishing Co., 1936, rev. 1939, 1947.



Bench Metals - Continued

7-1/2" x 10", paper bound, pp. 100, ind., ill., bibl.  
proj. 27.

Unit approach, project centered: specifications, assignments, equipment, materials, procedures, and working drawings for each project. Safety; sheet metals; ornamental iron work; bench metals; casting; art metal tooling; appendix of useful tables.

Content: (1) 2 3 4 5\* 6 (7) 11  
Objectives: A\* B (D) F  
Use Pattern: Crafts or Avocational  
Subject: Metalworking, General Bench

## Metalwork

Smith, Robert E. Bench Metal Work. Bloomington: McKnight and McKnight Publishing Co., 1939, rev. 1952.  
7-1/2" x 10", paper bound, pp. 69, ind., ill., bibl., proj. 10.  
Unit approach.

Safety; tools; calculating and planning; common hand operations; finishing metals; tables of technical information; descriptions of common metals.

Content: 1 2 (3) 4 5 (6) 7 11  
Objectives: A\* B (D) F H  
Use Pattern: Crafts  
Subject: Metalwork, General Bench

Bureau of Industrial and Technical Education, New York State Education Department. Bench Work, Machine Shop Series. Albany, New York: Delmar Publishers, Inc., 1946.

7-1/2" x 10", paper bound, pp. 88, tab. cont., ill., ref., bibl.

Descriptions of tools; use and care of tools as follows: measuring tools, bench tools, layout tools; care of iron and steel stock; filing; abrasives.

The following publications included in the series: Machine Shop Measurement, Drill Press Work, Lathe Work, Milling Machine Work, and Shaper Work.

Content: 1\* 2\*(5) 6\* (7) 11  
Objectives: A\* B\*(D) F G  
Use Pattern: Specialization  
Subject: Metalwork, Bench



# Metalwork - Continued

Tustison, F. E., and Kranzusch, Ray F. Metalwork Essentials. Milwaukee: The Bruce Publishing Co., 1936.  
6" x 9", cloth bound, pp. 171, ind., ill., ref.

Unit approach: introduction, tools, materials, methods and study questions.

Measuring; layout; cutting with snips; soldering; bending and forming sheet metal; seaming sheet metal; punching, drilling, and fastening sheet metal; raising; sawing; cutting or shearing heavy metal; filing; grinding; ornamental metal; applying a finish; making bends; twisting; riveting; brazing; tapping and thread cutting; pipe work; making and pouring a mold; the metals; the manufacture of steel.

Content: 1 2 3 4 5 6 11  
Objectives: A B (D)  
Use Pattern: Crafts  
Subject: Metalwork, General Bench

Ruley, M. J. Projects in General Metal Work.  
Bloomington: McKnight and McKnight Publishing Co., 1951.  
6" x 9", cloth bound, pp. 79, tab. cont., proj. 35.  
Thirty-five projects, materials, references, procedures, and suggested related study. Bench and art metal projects.

Content: 4  
Subject: Metalwork, General

Butler, John C. Sheet Metal Theory and Practice.  
New York: John Wiley and Sons, Inc., 1944.  
8" x 11", paper bound, pp. 165, ind., ill.

Technical, subject centered approach: Materials, advanced practices, and organization of the production sheet metal shop. (Shipbuilding). Introduction; tools and machines; welding assembly; riveted assembly; soldering and fluxes; seams and locks; ship terms; compartmentation, and labeling; blueprint reading; measuring; templating; and use of paper patterns; material allowances; ventilation and heating; furniture, lockers, shelves and dressers; materials; shop practice.

Content: 1\* 2\* 3\*(4) 5 6\* (7) 9 10 11\* 12\*  
Objectives: A B\*(D) (E) F\* G\*\*  
Use Pattern: Specialization and Industrial Arts (Advanced)  
Subject: Metalwork, Sheet metal

Metalwork - Continued

Giachino, J. W. Basic Sheet Metal Practice.  
 Scranton: International Textbook Co., 1952.  
 5-1/2" x 8-1/2", cloth bound, pp. 238, ind., ill.  
 Operation and information unit approach.  
 Information units on metals and their specifications;  
 hand and machine operations in sheet metal; practice  
 exercises; projects.  
 Content: 1 2\* 3\* 4 5 6\*(7) 11 (12)  
 Objectives: A B\* D F (G)  
 Use Pattern: Specialization  
 Subject: Metalwork, Sheet Metal

Smith, Robert E. Sheet Metal Work. Bloomington:  
 McKnight and McKnight Publishing Co., 1952.  
 7-1/2" x 10", paper bound, pp. 71, ind., ill., bibl., proj. 7.  
 Information and operation unit approach.  
 Safety; materials; layout and developments; cutting opera-  
 tions; bending and forming; maintenance and adjustment of  
 equipment; beading; joints; soldering; tables and formulae.  
 Content: 1 2 3 4 5 6 7 (9) 11  
 Objectives: A\* B\* D\* F  
 Use Pattern: Specialization  
 Subject: Metalwork, Sheet Metal

Bureau of Industrial and Technical Education,  
New York State Education Department. Hand Processes,  
Sheet Metal Series, also Machine Processes, Sheet Metal  
Series. Albany, New York: Delmar Publishers, Inc., 1946.  
 7-1/2" x 10", paper bound, tab. cont., ill., ref.  
 Trade theory and fundamental process units.  
Hand Processes, pp. 146. Sheet metal characteristics;  
 tool descriptions and uses; care of tools; how to perform  
 basic hand operations in sheet metal.  
Machine Processes, pp. 86. Covers bar folders, hand brakes,  
 slip forming machines, beading and crimping machines, ring  
 and circle shear, burring machine, bench drill press and  
 accessories, and grinders.  
 Content: 1\* 2\*(5) 6\*(7) 11  
 Objectives: A\* B\*(D) F G\*  
 Use Pattern: Specialization  
 Subject: Metalwork, Sheet Metal

Bureau of Industrial and Technical Education, The  
New York State Education Department. Lathe Work, Machine  
Shop Series. Albany: Delmar Publishers, Inc., 1946.

### Metalwork - Continued

7-1/2" x 10", paper bound, pp. 164, tab. cont., ill., ref.  
Trade theory and fundamental process units.  
Lathe work between centers, and chuck work; grinders;  
auxiliary hand tools used in operating a lathe; cutter  
grinding.

Not complete without complete series as references.

Content: 1\* 2\* (5) 6\* 11  
Objectives: A\* B\*(D) F G  
Use Pattern: Specialization  
Subject: Metalwork, Machine Shop

Smith, Robert E. Machining of Metals. Bloomington: McKnight and McKnight Publishing Co., 1949.

7-1/2" x 10", cloth bound, pp. 222, ind., ill., bibl.,  
proj. 14.

Unit approach.

Measurements and measuring tools; the tool grinder and its operation; drills and drilling; the lathe and its operation; the shaper and its operation; the milling machine and its operation; the power hack saw and its operation; metal cutting bandsaws and their operation; surface grinders and grinding; technical tables.

Content: 1\* 2\* 3 4 5 6\* 11  
Objectives: A\* B\* D F G  
Use Pattern: Specialization  
Subject: Metalwork, Machine Shop

Shuman, John T., and Barde, Lewis H. How to Operate A Lathe. New York: John Wiley and Sons, Inc., 1944.  
5" x 8", cloth bound, pp. 157, ind., ill.

Question and Answer approach. Operational procedures and related information.

The lathe and its parts; preparing the work; driving and holding the work; putting cutting tools to work; speeds and feeds; cutting fluids; turning in the lathe; thread cutting.

Content: 1\* 2\* 6\* 11 12  
Objectives: (A) B\*\* F G\*  
Use Pattern: Specialization  
Subject: Metalwork, Machine Shop, Lathe

Whipple, G. Graham, and Baudek, Anthony C. Engine Lathe Operations. Bloomington: McKnight and McKnight Publishing Co., 1942.

7-1/2" x 10", paper bound, pp. 147, ind., ill., proj. 9.

Unit Approach: Introduction, tools and materials, procedure, references, and questions for review.

Layout for lathe work; mounting work; drilling; cutting

# Metalwork - Continued

operations and speeds; precision measuring; care of the lathe; description of the lathe, its parts, and their functions; thread cutting; tool grinding; heat treating; machining properties of common metals.

Content: 1\* 2\*\* (4) 6\* 11 12  
 Objectives: A\* B\*(D) F G\*  
 Use Pattern: Specialization  
 Subjects: Metalwork, Machine Shop, Lathe

Knight, Roy E. Machine Shop Projects for Trade, Vocational and High Schools. Bloomington: McKnight and McKnight Publishing Co., 1943.

7-1/2" x 10", Blueprints and Operation sheets, pp. 112, proj. 25. Shop regulations; suggested related topics; list of machines and major operations performed upon each; suggested additional projects. Projects are not related to a particular machine. Procedures not given.

Content: 4\*  
 Use Pattern: Supplementation, projects  
 Subject: Metalworking, Machine Shop.

Doe, Edwin W. Foundry Work. New York: John Wiley and Sons, Inc., 1951.

6" x 9", cloth bound, pp. 106, ind., ill., bibl., glossary. Technical Approach.

Introduction to the foundry industry; fundamental processes; foundry tools and equipment; patterns; sand molding; baked sand cores; melting and pouring metals and alloys; cleaning and finishing castings; occupational advantages in the foundry. A highly technical treatment of the subject.

Content: 1\* 2\* 3\* 5 6\*(8) (9) 10 11\* 12  
 Objectives: (A) B\* (C) D E F G  
 Use Patterns: Specialization and Industrial Arts  
 Subject: Metalwork, Foundry

Smith, Robert E. Units in Patternmaking and Foundry. Bloomington: McKnight and McKnight Publishing Co., 1939.

7-1/2" x 10", paper bound, pp. 72, tab. cont. ill., proj. 10. Information and operation unit approach.

Introduction; safety; technical terms; pattern materials and accessories; how to make simple split and segment patterns; how to make core boxes; how to make core prints; molding

Metalwork - Continued

materials; molding tools and equipment; mold making; core making; furnaces and ovens used in foundry practices; identification of metals; how to prepare and pour metals; how to remove gates and clean castings; general information on the production of metals (aluminum, antimony, copper and copper alloys, iron and steel, wrought iron, lead, tin, and zinc).

Content: 1 2 3 4 5 6 (7)(8) (9)(10) 11  
 Objectives: A B (D) F  
 Use Pattern: Industrial Arts  
 Subject: Metalwork, Foundry, Pattermmaking

Smith, Robert E. Forging and Welding. Bloomington: McKnight and McKnight Publishing Co., 1939. 7-1/2" x 10", paper bound, pp. 56, tab. cont. ill., proj. 18. Information and operation unit approach.

Introduction; safety; forges and fuels; metals; measuring and cutting stock; tongs; upsetting; drawing; bending; twisting; fuller and swage; punching; forging and heat treating tool steel; forge welding; brazing; oxyacetylene welding; oxyacetylene cutting; arc welding; carbon arc welding and cutting; spot welding.

Content: 1 2 3 4 5 6 (7)(9) 11  
 Objectives: A B (D) F  
 Use Pattern: Industrial Arts (weak) and Specialization (weak)  
 Subject: Metalwork, Forging and Welding

Jennings, R. F. Gas and A. C. Arc Welding and Cutting. Bloomington: McKnight and McKnight Publishing Co., 1937, rev. 1946.

8" x 10", paper bound, pp. 89, ind., ill., bibl.

Information and operation unit approach. The basic operations performed in gas and arc weldings: mild steel and iron, cast iron, copper, brass, bronze, aluminum, die cast metal, stainless steel, monel, et cetera. Special section on equipping the school shop, the nature and characteristics of metals, the manufacture of gases, and special techniques.

Content: 1 2\* 3\* 4 5 6 (7)(9)(10) 11 12  
 Objectives: A\* B\* D (E) F G  
 Use Pattern: Specialization and Industrial Arts  
 Subject: Metalwork, Welding



Metalwork - Continued

Rigsby, Herbert P., and Groneman, Chris H.  
Elementary and Applied Welding. Milwaukee: The Bruce  
 Publishing Co., 1948.  
 5-1/2" x 8-1/2", cloth bound, pp. 148, ind., ill., proj. 39.  
 Unit approach: introductory discussion and procedure.  
 Welding and its place in industry; welding equipment and  
 materials; welding rods; electrodes and fluxes; metals used  
 in welding; safety practices; oxyacetylene welding and cut-  
 ting; electric arc welding; types of joints and their  
 preparation; welding in various positions; installing weld-  
 ing equipment; welding nonferrous metals.  
 Content: 1 2 3 4\* 5 6 11  
 Objectives: A B\* D F  
 Use Pattern: Specialization  
 Subject: Metalwork, Welding

Zielke, Charles H. Arc Welding. Milwaukee:  
 The Bruce Publishing Co., 1952  
 8" x 10-1/2", paper bound, pp. 63, tab. cont., ill.  
 Lesson unit approach: tools and equipment, materials,  
 information and procedure, and review questions.  
 General information; definition of terms; lesson series.  
 Content: 1 2\*\* 3 5 6 11 12  
 Objectives: A B\*\* (D) F G\*  
 Use Pattern: Specialization  
 Subject: Metalwork, Arc Welding

Woodworking

Bassett, Kendall T., Thurman, Arthur B., and D'Amico,  
 Victor. The Museum of Modern Arts. How to Make Objects of  
Wood. Scranton: International Textbook Co., 1951.  
 7-1/2" x 10", cloth bound, ind., ill., bibl.  
 Project centered instruction. From simple to complex.  
 Introduction; the material; the tools; the design; box  
 construction; simple cabinet making; joints; frame making;  
 picture framing; box construction using mitered joints;  
 toy making; tables; advanced cabinet making; wood turn-  
 ing; model making; sharpening tools; power tools (table  
 saw, jig saw, band saw, drill press, sanding machine);  
 planning the home shop; purchase and storage of lumber;  
 screws and nails; and, finishing processes.  
 Content: 1 2 3 4 5 6 7\*\* 8\* (9) 11 13\* 14\*  
 Objectives: A\* B C (D)(E) F H\* I\*\*  
 Use Pattern: Industrial Arts and Crafts  
 Subject: Woodworking, general



### Woodworking - Continued

Brown, Arthur G., and Tustison, F. E. Instructional Units in Hand Woodworking. Milwaukee: The Bruce Publishing Co., 1930.

5-1/2" x 8-1/2", cloth bound, pp. 218, ind., ill., ref. Operation unit centered. Review questions. Planning; hand operations; layout; tool fitting; common joinery; sanding; analysis chart illustrated.

Content: 1 2\* 5 6 7  
Objectives: A\*  
Use Pattern: Specialization  
Subject: Woodworking, General

Bureau of Industrial and Technical Education, New York State Education Department. Suggested Unit Course in the Use of Hand Tools and Portable Machinery. Albany, New York: Delmar Publishers, 1946.

7-1/2" x 10", paper bound (spiral) pp. 191, ill., tab. cont., bibl. Information and operation unit, theory and process: Measuring; layout; all common hand tools; sharpening operations; coated abrasives; electric hand saws; radial arm saw; electric powerplanes; drills; mortisers; routers; and electric sanders.

Content: 1\* 2\* 6  
Objectives: A B\*  
Use Pattern: Specialization  
Subject: Woodworking, Carpentry

Cramlet, Ross C. Woodworking Visualized. Milwaukee: The Bruce Publishing Co. 1950.

8" x 10-1/2", paper bound, pp. 155, ind., ill., Proj. 20. Tool, Material, and Process Centered. Planning Sheet for job analyses; tools and procedures through pictorial presentations; common tools and hand procedures; how to select woods; how trees grow; how lumber is sawn; the effects of moisture on woods; tool sharpening; common joinery; hardware; glueing; selection of abrasives for finishing; squaring stock; layout.

Content: 1\* 2\* 3\* 4 6  
Objectives: A B\*  
Use Pattern: Specialization  
Subjects: Woodworking, Hand

Woodworking - ContinuedFeirer, John L. Industrial Arts Woodworking.

Peoria: Charles A. Bennett Co., Inc., 1950.

6" x 9", cloth bound, pp. 290, ind., ill., Proj. 44.

Organized around operation families and related information. From woods to products through processes; getting started in woodworking; getting out the rough stock; completing the squaring operations; making pieces of curved or irregular designs; decorating, shaping, and bending woods; cutting holes; making joints; assembling; finished projects; sharpening tools; machine woodworking (the circular saw, the band saw, the jig saw, jointer, drill press, sanders, shaper, and wood lathe); wood and wood products; projects.

Contents: 1 2 3\* 4 5\* 6 7 (8) 9 10 11 14

Objectives: A\* B (C) D\* E F I

Use Pattern: Industrial Arts

Subject: Woodworking, General

Fryklund, Verne C. and Laberge, Arnold J. General Shop Woodworking. Bloomington: McKnight and McKnight Publishing Co., 1946.

8" x 10", paper bound, pp. 157, ind., ill., ref.

Operation and information unit organization.

Hand tools and the jig saw; related information on lumbering; conservation of forests; characteristics and sources of common woods; finishing materials and their uses; moisture content and its effect upon lumber; occupational opportunities; design and woodworking; planning procedures; and how some of the common hardware are made and sold and used.

Content: 1\* 2\* 3\* 4\* 5\* 6\* 7 9 10\* 13\* 14\*

Objectives: A\* B\* C D\* E G H

Use Pattern: Industrial Arts

Subject: Woodworking, General

Groneman, Chris H. General Woodworking. New York: McGraw-Hill Book Company, 1952.

6-1/2" x 9-1/2" cloth bound, pp. 214, ind., ill., Proj. 19.

Information and operation unit: General Information, hand tool processes, machine tool processes, related information. Student planning sheet; student accident report form; safety rules for each machine and for hand tools; brief section on occupations in woodworking; period design; and units on the home workshop. Discussion questions.

Content: 1 2 3 4 5\* 7 8 9 10 11\* 13\*

Objectives: A B D\* E F H\* I

Use Pattern: Industrial Arts

Subject: Woodworking, General

# Woodworking - Continued

Haines, Ray E. The Bandsaw and Jigsaw. The Home Workshop Series. New York: D. Van Nostrand Co., 1953. 7-1/2" x 10", cloth bound, pp. 137, ind., ill., Proj. 30. Operation centered: Projects, materials, procedures, working and pictorial drawings. History; basic principles; construction and features; refitting; basic operating principles; advanced operations; special operations. Safety rules in text.

Content: 1 2 (3) 4 (5) 6\* 11 (12) 13  
 Objectives: A B\* (F) (G) (H)  
 Use Pattern: Crafts and Specialization  
 Subject: Woodworking, Machine (Reference Bandsaw and Jigsaw)

Haines, Ray E. The Circular Saw. The Home Workshop Series. New York: D. Van Nostrand Co., 1952. 7-1/2" x 10", cloth bound, pp. 115, ind., ill., Proj. 28. Operation centered: Projects, material list, procedures, working and pictorial drawings. History; basic principles; construction and features; tools and accessories; basic operations; care and refitting of saws.

Content: 1 2 (3) 4 (5) 6\* 11 (12) 13  
 Objectives: A B\* (F) (G) (H)  
 Use Pattern: Crafts and Specialization  
 Subject: Woodworking, Machine (Reference circular saw)

Haines, Ray E. The Woodworking Lathe. The Home Workshop Series. New York: D. Van Nostrand Co., 1952. 7-1/2" x 10", cloth bound, pp. 130, ind., ill., Proj. 30. Operation centered: Projects, materials, procedures, working drawings and photo or pictorial drawings. History; basic principles; construction; tools and accessories; care and refitting of tools; basic turning operations; finishing in the lathe; turning Keene cement; special turning; metal spinning.

Content: 1 (2) (3) 4 (5) 6\* 11 (12) 13  
 Objectives: A B\* (F) (G) (H)  
 Use Pattern: Crafts and Specialization  
 Subject: Woodworking, Machine (Reference lathe)

Woodworking - Continued

Hjorth, Herman. Basic Woodworking Processes. Milwaukee: The Bruce Publishing Co., 1933, rev. 1935. 5-1/2" x 9-1/2", cloth bound, pp. 241, ind., ill., Proj. 5. Process centered: comprehensive directions for hand wood-working processes. Sharpening tools; laying out; joiner; glueing; metal fastenings; wood finishing; job-sheet outlines; source reference; review questions.  
 Content: 1 2\* 5 6\*  
 Objectives: A\* B\* D  
 Use Pattern: Specialization  
 Subject: Woodworking, Reference

Hjorth, Herman. Machine Woodworking. Milwaukee: The Bruce Publishing Co., 1937. 6" x 8-1/2", cloth bound, pp. 362, ind., ill., safety rules. Machine and operation centered. Historical development of woodworking machinery; operations performed; adjustments of machines; installation and maintenance of machinery; accessories; jigs. The following machines covered: Circular saws, band saws, and jig saws; planing and scraping machines; shapers and routers; mortisers and borers; tenoners; woodturning lathes; sanding machines; glue-room machinery and equipment.  
 Content: 1\* 2\* 5 6\* 11\* 12\*  
 Objectives: A\* B\* D E F G\*  
 Use Pattern: Specialization  
 Subject: Woodworking, Machine

Hjorth, Herman. Operation of Common Woodworking Machines. Milwaukee: The Bruce Publishing Company, 1942. 8" x 10", paper bound, pp. 160, ind., ill. Information unit centered. Descriptions of construction and operation of the following woodworking machines: Circular saw, band saw, jig saw, joiner, planer, mortiser, shaper, router, drill press, sanding machines, and turning lathe. Sharpening operations for all machines; safety rules. Review questions; and jigs for production.  
 Content: 1\* 2\* 5 6\* 11  
 Objectives: A\* B\* D F G  
 Use Pattern: Specialization  
 Subject: Woodworking, Machine

# Woodworking - Continued

Hjorth, Herman. Principles of Woodworking. Milwaukee: The Bruce Publishing Co., 1930, rev. 1946. 6" x 9-1/2", cloth bound, pp. 440, ind., ill., Proj. 17. Instruction sheet organization. Job centered. History of woodworking tools; hand tools; machine tools; tool sharpening; planing and squaring to dimensions; joints; miscellaneous constructions; glueing and clamping; metal fastenings; woodturning; surface decoration; upholstery; wood finishing; woods ( growth, conservation, lumbering characteristics; seasoning, grading, manufactured dimensions and shapes, plywood and veneers); applied projects; and review questions for each chapter.

Content: 1\* 2\* 3\* 4 5 6\* 7 11  
 Objectives: A\* B\* D F G H  
 Use Pattern: Specialization  
 Subject: Woodworking, Cabinet Making

Johnson, William H., and Newkirk, Louis V. General Woodworking, New York: The Macmillan Co., 1946. 8" x 11", cloth bound, pp. 277, ind., ill., ref. projects 50. Information and operation units. Questions for review. The woods we use; working with wood; hand operation; machine woodworking (circular saw, joiner, band saw, jig saw, shaper and lathe); wood finishing; cabinet making; carpentry; woodturning; pattern-making; woodcarving; the home workshop.

Content: 1 2 3 4 5 (6) 11 13  
 Objectives: A (B)(C)(D) F H  
 Use Pattern: Crafts  
 Subject: Woodworking, General

Reid, John F., and Higgins, Gordon H. Fundamentals of the Woodworking Trades. New York: John Wiley and Sons, Ind., 1931. 6" x 9", cloth bound, pp. 236, ind., and ill. General technical approach to subject matter. Tool and process centered. Selection of woods; measuring and squaring; use of common woodworking handtools; tool sharpening; joinery; metal fastenings; woodfinishing; woodturning; cabinet construction; chair construction; door construction; selecting and installing hardware; special section on rodding.

Content: 1 2 3\* 5 6\* (12)  
 Objectives: (A)(B) (D) (G)  
 Use Pattern: Specialization  
 Subject: Woodworking, Cabinet Making and Millwork



### Woodworking - Continued

Shea, John G. and Wenger, Paul N. Woodworking for Everybody. Scranton: International Textbook Co., 1944, rev. 1953.  
 8-1/2" x 11", cloth bound, pp. 200, ind., ill., proj. 62.  
 Tool-family and operation centered.  
 The story of wood; shop equipment (equipment and hand tools by general family classes); processes; joinery; woodworking machinery; tool sharpening; wood finishing; safety; projects.

Content: 1 2 3\* 4\* 5\* (6) 7 9 11 13  
 Objectives: A\* B (D) F H  
 Use Pattern: Industrial Arts  
 Subject: Woodworking, General

Smith, Robert E. Machine Woodworking. Bloomington: McKnight and McKnight Publishing Co., 1948.  
 8" x 10-1/2", cloth bound, pp. 149, ind. ill.  
 Unit centered: Descriptions, operations, adjustment, and fitting of the following machines: lathe, grinders, circular saw, band and jig saws, jointer, planer, mortiser, shapers, routers, sanders. Special tables. Safety rules in text in bold type.

Content: 1\* 2\* 5 6\* 11\* 14  
 Objectives: A B\*  
 Use Pattern: Specialization  
 Subject: Woodworking, Machine

The University of the State of New York, Suggested Related Information for the Woods Area. Albany, New York: Delmar Publishers, Inc., 1950.  
 7-1/2" x 10-1/2", cloth bound, pp. 142, ind., ill., ref.  
 Relation information and subject integration.  
 Planning; social economics; guidance; science; safety and hygiene; consumer values; bibliography (books, films, periodicals, manuals, pamphlets, and charts).

Content: (1) 3 5\* (6) 7\* 8\* 9\* 10\* 11\* 14\*  
 Objectives: (A) (B) C\* D\* E\* F I\*  
 Use Pattern: Industrial Arts  
 Subject: Woodworking, General and Reference



# Woodworking - Continued

Van Tassel, Raymond. Woodworking Crafts. New York: D. Van Nostrand Co., Inc., 1948.  
 5-1/2" x 8-1/2", cloth bound, pp. 151, tab. cont., ill.  
 Job sheet approach. Progressive project centered.  
 Whittling; coping saw work; squaring stock; elementary joinery; inlaying and veneering; wood carving.  
 Content: (1) 2 (3) 4 5 (6) 13  
 Objectives: A (B) H  
 Use Pattern: Crafts  
 Subject: Woodworking, Handcrafts

Bexter, William T., and Lackey, Paul G. Woodworking, Projects and Upholstery. New York: D. Van Nostrand Co., Inc. 1941. 5-1/2" x 8-1/2", cloth bound, pp. 245, ind., ill., proj. 40. Information centered around tools, materials and processes. Introduction; hand tools; glue and glueing; coated abrasives; fastenings; wood finishing; the wood lathe; power saws; principles of upholstering; projects - drawings, photos, and procedures.  
 Content: 1 2 (3) 4 (6) 11  
 Objectives: A B  
 Use Pattern: Crafts  
 Subject: Woodworking, General

Douglas, J. H., and Roberts, R. H. Projects in Woodwork. Bloomington: McKnight and McKnight Publishing Co., 1948.  
 8" x 10-1/2", cloth bound, pp. 135, proj. 100.  
 Graded projects - materials, construction, working drawings, photographs, and general information.  
 Content: 4 (5) (6)  
 Objectives: A  
 Use Pattern: No Pattern  
 Subject: Woodworking, projects (reference)

Menke, H. A. 28 Table Lamp Projects. Bloomington: McKnight and McKnight Publishing Co., 1953.  
 6" x 9", cloth bound, pp. 78, ill., tab. cont.  
 Suggestions for lamp construction; finishing instructions, and materials.  
 Content: 2 4\* 5 (6) 7  
 Objectives: A\* H  
 Use Pattern: No Pattern (project)  
 Subject: Woodworking, projects.

## APPENDIX B

January 22, 1953

Mr. William McKnight, Jr.  
McKnight & McKnight Publishing Co.  
Market and Center Streets  
Bloomington, Illinois

Dear Sir:

During the past year at the request of the Council of State Supervisors of Industrial Arts I have served as chairman of a group of industrial arts educators who are interested in securing objective data covering textbook emphases in the field. A progress report was given during the recent AVA Convention. It was the decision of the group that this study should be continued and that an appraisal should be made of industrial arts textbooks now available to the public. The membership of the American Industrial Arts Association and the American Council on I.A. Teacher Education have also expressed interest and concern with the same problem.

The primary purpose of this study is to determine the emphases as they relate to subject area coverage, and to meeting the accepted objectives of industrial arts education. The study will attempt to identify those textbooks which best meet the over-all objectives of industrial arts and to classify textbooks for specialization and orientational purposes.

In order to complete this study it will be necessary to examine the publications available to the field of industrial arts. We are asking each of the major publishers of industrial arts textbooks to cooperate by making their publications available for examination on a loan basis. We will not need access to the books for more than a three-month period and we will defray all transportation charges. For the purposes of accuracy all industrial arts textbook publications which you have made available to the public this current school year should be included in the group.

Please know that it is the intent of the group working with this problem to take a positive approach and there will be

no reason for embarrassment on the part of any author or publisher in terms of the findings and their interpretations. The sole desire is to upgrade the profession with which you are so prominently identified and in which we are so busily engaged.

We wish to thank you in advance for your courtesy and help in this enterprise.

Very truly yours,

Walter R. Williams, Jr.  
Professor of Education and  
Head, Industrial Arts and  
Vocational Education

WRW:bb

## BIBLIOGRAPHY

- American Textbook Publishers Institute. Textbooks in Education. New York: The American Textbook Publishers Institute, 1949
- American Vocational Association. A Statement of the Place and Function of Industrial Arts in Education. A report prepared by the Industrial Arts Policy and Planning Committee of the American Vocational Association. Washington: American Vocational Association, 1952.
- Anderson, Lewis F. History of Manual and Industrial School Education. New York: D. Appleton and Company, 1926.
- Bennett, Charles A. History of Manual and Industrial Education, 1870-1918. Peoria, Illinois: The Manual Arts Press, 1926.
- Bode, Boyd H. How We Learn. Boston: D. C. Heath and Company, 1940.
- Bonser, Fredrick G., and Mossman, Lois C. Industrial Arts for Elementary Schools. New York: The Macmillan Co., 1924.
- Buckingham, B. R., et. al. "What Are Textbooks For?" A Symposium, Phi Delta Kappan, Vol. XXXIII, No. 5, (January, 1952) 241.
- Cartwright, William C. How to Use a Textbook. How to Do It Series, Number 2. Washington: National Council for the Social Studies, 1947.
- Cooperative Study of Secondary-School Standards, Evaluative Criteria, Washington: Cooperative Study of Secondary-Schools Standards, 1950.
- Cronback, Lee J. "Children's Textbooks and Personality Development." The School Review. Vol. 56 (April, 1948) 196.
- Dewey, John. How We Learn. Boston: D. C. Heath and Co., 1933.

- Dewey, John. Democracy and Education. New York: The Macmillan Co., 1916.
- Dolch, W. W. "Textbooks," Encyclopedia of Educational Research, pp. 1478-81. Walter S. Monroe, ed., New York: The Macmillan Co., 1952.
- Educational Policies Commission. Education for All American Youth, A Further Look. Washington: National Education Association, 1952.
- Ericson, Emanuel E. Teaching the Industrial Arts. Peoria, Illinois: The Manual Arts Press, 1946.
- Exton, Elaine, "Views on Textbook Trends," American School Board Journal, Vol. 119, (October, 1949) 539.
- Freeze, John F. Course Making in Industrial Education. Peoria, Illinois: The Manual Arts Press, 1946.
- Fryklund, Verne C. Trade and Job Analysis. Milwaukee: The Bruce Publishing Company, 1942 and 1947.
- Henry, Nelson B. "Selecting Textbooks for the Schools," The School Review, Vol. 56, (November, 1948) 502-3.
- Institute of American Textbook Publishers, "Six Tests of Textbooks," American School Board Journal, Vol. 122, No. 6, (June, 1951) 25.
- Kandel, I. L. "Case for the Revision of School Books," School and Society, Vol. 67, (April, 10, 1948) 276.
- Kandel, I. L. "Scrutiny of Textbooks," School and Society, Vol. 70, (August, 6, 1949) 91.
- Keller, Franklin J. Principles of Vocational Education. Boston: D. C. Heath and Company, 1948.
- Kelley, Earl C. Education for What is Real. New York: Harper and Brothers Publishers, 1947.
- Kelley, Earl C. The Workshop Way of Learning. New York: Harper and Brothers Publishers, 1951.
- Knowlton, P. A. "What's Wrong With Textbooks," School Executive, Vol. 70 (October, 1950) 56.

McCall, W. Morrison, et al. Better Use of Textbooks.  
Bulletin No. 4, Montgomery, Alabama: State Department of Education, 1948.

Mays, Arthur B. Principles and Practices of Vocational Education. New York: McGraw-Hill Book Company, Inc., 1948.

National Society for the Study of Education. Thirtieth Yearbook, Part II. The Textbook in American Education. Prepared by W. C. Bagley et al., Bloomington, Illinois: Public School Publishing Company, 1931.

Newkirk, Louis V. Organizing and Teaching the General Shop. Peoria, Illinois: The Manual Arts Press, 1947.

Newkirk, Louis V., and Johnson, William H. The Industrial Arts Program. New York: The Macmillan Co., 1948.

Rugg, Harold. Foundations for American Education. Yonkers-On-Hudson, New York: World Book Company, 1947.

State Committee on Coordination and Development, William E. Warner, et al. A Prospectus for Industrial Arts in Ohio. Columbus, Ohio: Ohio Education Association, 1934.

Tuttle, Edward M. "What Goes Into the Making of a Textbook," NEA Journal, Vol. 38 (April, 1949) 266.

U. S. Office of Education. "Offerings and Enrollments in High-School Subjects," The Biennial Survey of Education in the United States, Chapter 5, 1948-49. Washington: Government Printing Office, 1951.

Wilber, Gordon O. Industrial Arts in General Education. Scranton, Pennsylvania: The International Textbook Company, 1949.

Williams, Walter R., et al. Florida Presents a Guide to the New Technology in Industrial Arts. Bulletin No. 12, 2nd edition. Tallahassee, Florida: State Department of Education, 1948.



### BIOGRAPHICAL SKETCH

Talmage B. Young was born in Irwin County, Georgia, February 2, 1919. After completing high school at Ocilla, Georgia, he entered Berry College, where he majored in Industrial Arts, receiving his Bachelor of Science degree with honors in February, 1940.

After graduation he taught industrial arts for one semester at Brainerd Junior High School, Chattanooga, Tennessee. He was associated with the National Youth Administration as an instructor in woodworking and related training for three years.

He entered the United States Air Force in 1943 and served in the China-Burma-India Theater of operations as Bombardier and as Base Fire Marshal. After his discharge in 1946 he was employed as Superintendent of Buildings and Grounds at West Georgia College, Carrollton, Georgia. He taught industrial arts in Fitzgerald High School in 1947.

He has had experience since that time as owner-operator of a woodshop specializing in the construction of custom woodwork and as foreman of a furniture factory. In February, 1950, he entered the University of Florida, receiving a Bachelor of Science degree in education, and graduating with honors, in February, 1951. He received the Master of Arts degree in Education in August, 1951.

He is a member of Phi Kappa Phi, Kappa Delta Pi, and Epsilon Pi Tau honorary fraternities. He has been appointed to the position of Chairman of the Division of Industrial Arts, Berry College, Rome, Georgia in September, 1953.

This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of the committee. It was submitted to the Dean of the College of Education and to the Graduate Council and was approved as partial fulfillment of the requirements for the degree of Doctor of Education.

June 8, 1953

J. B. White  
Dean, College of Education

D. E. Hunter  
Dean, Graduate School

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